# SAN DIEGO ZOO

FROM LOS ANGELES
US 101
FROM RIVERSIDE
US 395
US 80
FROM PHOENIX
CAMINO DEL RIO
TEXAS STREET
EL CAJON
ALT. US 80
MIDWAY
OLD TOWN
WASHINGTON
UNIVERSITY
WASHINGTON
BARNETT
ROSECRANS
PACIFIC HIGHWAY
STATE STREET
SIXTH AVENUE
CABRILLO FREEWAY
ZOO ENTRANCE
BALBOA PARK
PERSHING DRIVE
30th STREET
HARBOR DRIVE
LAUREL
CROSSTOWN FREEWAY
PARK BLVD.
SAN DIEGO BAY
BROADWAY
MARKET STREET
12th ST.
IMPERIAL AVENUE
NATIONAL
28th STREET
FERRY
FROM HARBOR DRIVE
FROM TIJUANA
US 101
CORONADO
ORANGE AVENUE
ZOOLOGICAL SOCIETY
SAN DIEGO
PACIFIC OCEAN
STRAND FROM TIJUANA
MAIN THOROUGHFARES
AND BUS LINES
LEADING TO
SAN DIEGO ZOO
1 AIRPORT
2 CIVIC CENTER
3 RAILROAD STATION
4 CHAMBER OF COMMERCE
5 TOURIST BUREAU
6 AUTO CLUB
7 BUS STOP – LINE 7

# San Diego Zoo

**BALBOA PARK**
**San Diego, California**

## OFFICIAL GUIDE BOOK

**of the San Diego Zoological Garden, Published by the Zoological Society of San Diego, Inc.**
**Box 551, San Diego 12, California**

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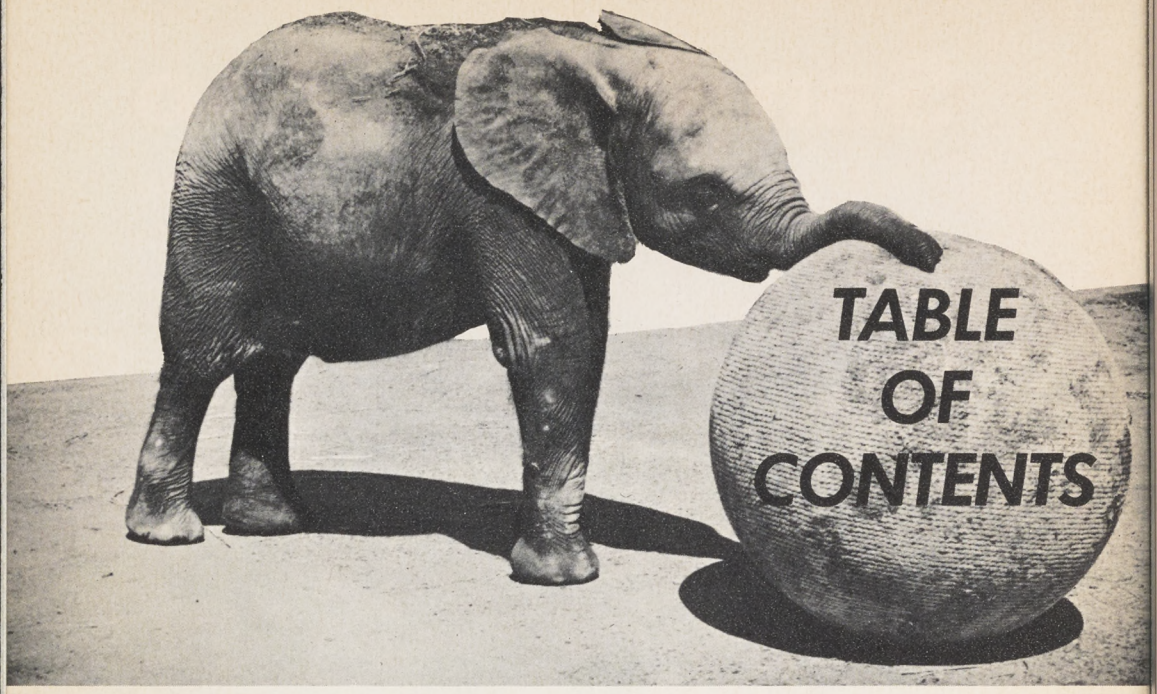


AFRICAN BUSH ELEPHANT

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Picture on Title Page:
FENNEC — North Africa

# INTRODUCTION

The San Diego Zoological Garden is unique among most United States zoos in that *it exhibits nearly all animals outdoors the year around.*

In this city of more than half-a-million people the weather is tempered by the Pacific Ocean, with the result that summers are cooler and winters warmer than the latitude would indicate. Rainfall averages only 10 inches a year, wind velocities are low, and 330 out of 365 days have sunshine! High mesas, cut by deep canyons, give good air drainage.

The Zoo is located in beautiful Balboa Park, just five minutes from downtown San Diego. It is easy to reach from any of the major highways leading into the city, as well as from the airport and railroad depot.

Because of our healthful climate, and our friendly exchange relations with other zoos, the San Diego Zoo contains one of the largest and rarest collections in the world. It exceeds most others in the number of animals and species exhibited. Within the Zoo and Balboa Park we harvest the leaves from many exotic plants relished by our animals. This enables us to exhibit and maintain many animals not usually seen in captivity.

The Zoo's 100 acres of well-planted canyons and mesas are interlaced by paths and roads, with animal enclosures located so as to permit best visibility for pedestrian and bus rider. Ours is the only zoo which provides a complete guided bus tour of its grounds — 40 minutes, and 3½ miles.

Annual attendance at the Zoo exceeds two million, with a ratio of three children under 16 years, to five adults. After they have visited the Zoo many of our visitors find it convenient to visit other outstanding attractions close by, including the Fine Arts Gallery, Botanical Gardens, Museum of Man, Museum of Natural History, and Hall of Champions.

**ZOO ENTRANCE**

# GENERAL INFORMATION

ENTRANCE:

The single entrance and exit are located on Zoo Drive in the heart of Balboa Park.

Entrance hours:

Day after Labor Day thru October . . . . . .9 a.m.-5 p.m.

November thru February . . . . . .9 a.m.-4:30 p.m.

March thru June . . . . .9 a.m.-5 p.m.

July thru Labor Day . .9 a.m.-6 p.m.

Visitors may stay on premises until dusk.

**Children's Zoo**

**Day after Labor Day thru June . . .**

**9:30 a. m.-4:30 p. m.**

**July thru Labor Day . . .**

**9:30 a. m.-5:30 p. m.**

PARKING FACILITIES:

Free parking is available for Zoo patrons on lots just south of the entrance and across the street from the entrance, accommodating more than 2000 cars.

EATING PLACES:

The San Diego Zoo has an excellent restaurant, serving dinners and short orders. Counter, fountain and table service are available.

Hours:

All year . . . . . .9 a.m.-5 p.m.

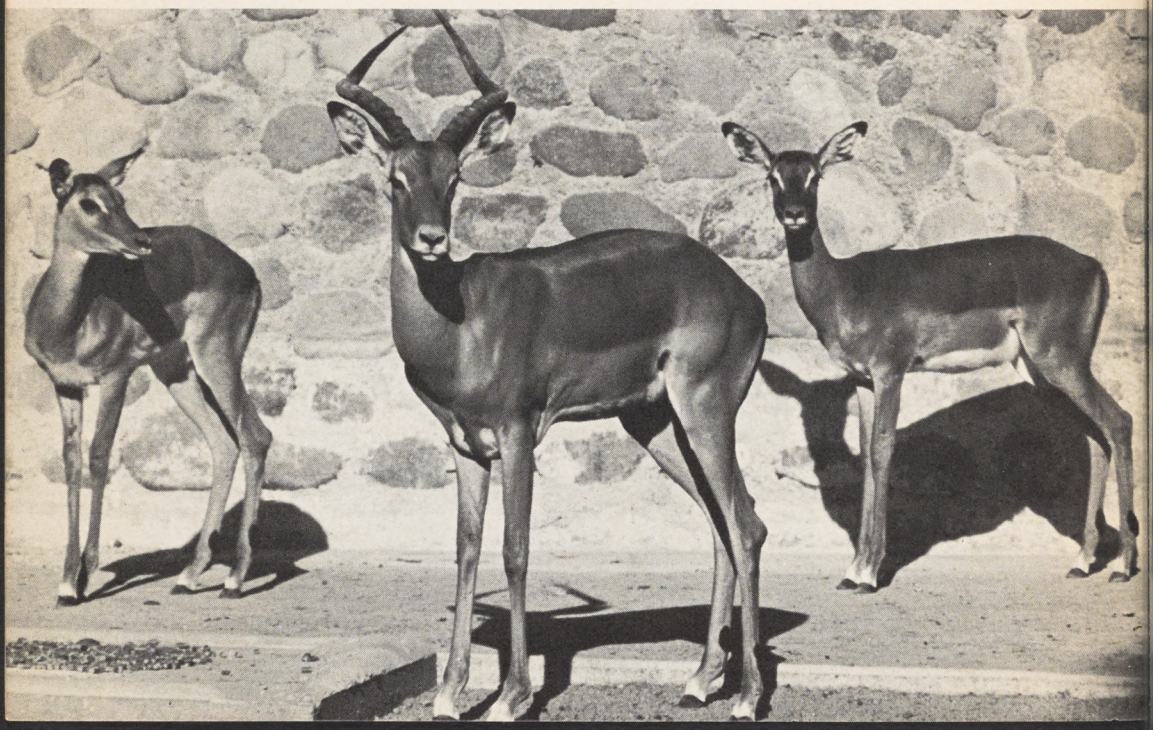
Many large refreshment stands, supplemented with dispensing machines, are placed throughout the Zoo. Soft drinks, candy, ice cream, peanuts, sandwiches and other food are available as well as guide books and film.

There are many picnic grounds within the Zoo. At the south picnic area free gas is provided for cooking purposes.

ADMISSIONS:

Adults $1.00. Children to 16 years of age and all San Diego City and County high school students with valid I. D. cards are admitted free.

Children's Zoo .15 to everyone over two years.



SOUVENIRS:

Gifts, postcards and Zoo publications are sold at the gift shops and camera stand.

CAMERA STAND:

Film, camera rentals, postcards, slides, motion pictures, animal sounds, and publications are sold. Lockers for checking personal belongings are on the main plaza.

ANIMAL ACTS:

Trained seals perform in the Wegeforth Bowl on A-Mesa every day throughout the year. Admission is free.

GUIDED BUS TOURS:

Frequent guided bus service is available for a 40-minute, three-and-one-half-mile trip through the Zoo. Experienced driver-guides describe the animals.

Bus Schedule:

Day after Labor Day thru June . . . . . .
9 a.m.-4 p.m.

July thru Labor Day . . . . . .
9 a.m.-5:30 p.m.

MEMBERSHIP:

Members of the Zoological Society of San Diego are admitted free to the main Zoo every day of the year. Refer to page 111 for further information pertaining to membership.

## How to Reach The San Diego Zoo

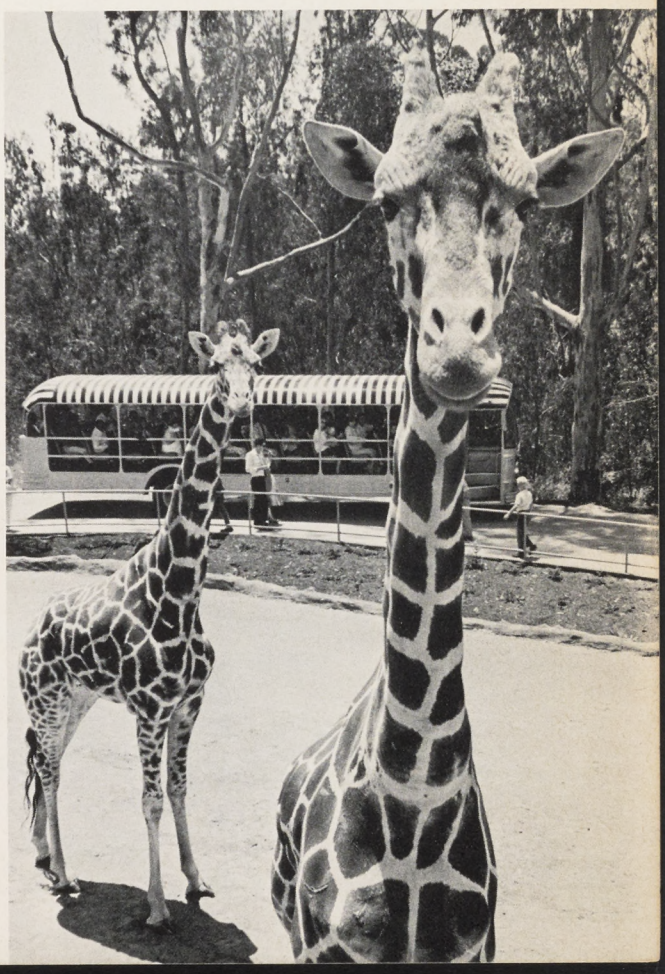
AUTOMOBILE ROUTES:

Refer to the map inside front cover.

BUSES:

For those using public transportation: Take any eastbound Number Seven bus from any corner on Broadway from Harbor Drive to 11th Street. This bus runs on Park Boulevard and makes a Zoo Stop one block east of the entrance. Coming in from the northeastern sections of the city transfer at Park and University to the inbound (returning downtown) bus No. 7.

To come to the Zoo from other sections of San Diego take your local bus which travels to the downtown area and transfer to the eastbound No. 7 bus on Broadway.



**GUIDED BUS TOUR at Reticulated Giraffe enclosure**

**IMPALA**
**Africa, Facing Page**

# CHILDREN'S ZOO

**CLARK CHILDREN'S THEATRE**

The San Diego Children's Zoo is built to the scale of four-year-old children, but accommodates visitors of all ages. Because of numerous innovations in the construction and design of animal enclosures, it has been described as the most modern and imaginative exhibit of animals in the world. Everything has been arranged to provide maximum safety and maximum opportunity for the children to be with the animals.

Children can "treat" their friends to a special party in the Children's Zoo. Two cozy areas have been set aside for these parties, complete with tables and play structures, with all favors, refreshments and paraphernalia provided by the Zoo at a nominal fee.

**Photo on opposite page:**
**FISHING OWL—Malaysia**

LION CUB in contact area

SEAL and SEALION Pool

**AOUDAD lamb**

## One-way Traffic

In general, a scheme of one-way traffic is followed in the Children's Zoo, to provide better control, efficient use of the compact area, and assurance that no small visitor will miss anything, or be lost.

Starting from the ticket window, with its counter just 25 inches high, the Zoo is laid out so that a child will wonder "What's next?" just around the corner.

## Year-round Display

Altogether, the Children's Zoo features more than 30 exhibits, containing at least 250 animals, representing over 130 species. They range from beautiful macaws to spider monkeys, and include many animals which can be petted or seen at extremely close range. Unlike most other zoos for children, which operate only during the warmer months, this attraction is a per-

MACAW exhibit

Learning to love animals

Young Apes, CHIMPANZEE, ORANG-UTAN and GORILLA

**Turtletorium**

manent, year-round exhibit area. Many of the structures have special electric radiant heating systems in the floors to keep the animals warm at night during the cool months. Although light and artistic in appearance, structures are of steel and gunite-cemented construction.

The opening of our Children's Zoo in the summer of 1957 followed conferences, planning and designing over a period of three years. This was climaxed by a fund-raising campaign which attracted contributions from a cross-section of our city's population, including children and industrial concerns.

The annual attendance at the Children's Zoo now approaches 1,000,000. A modest admission charge is the sole source of support for this distinctive zoo within a zoo.

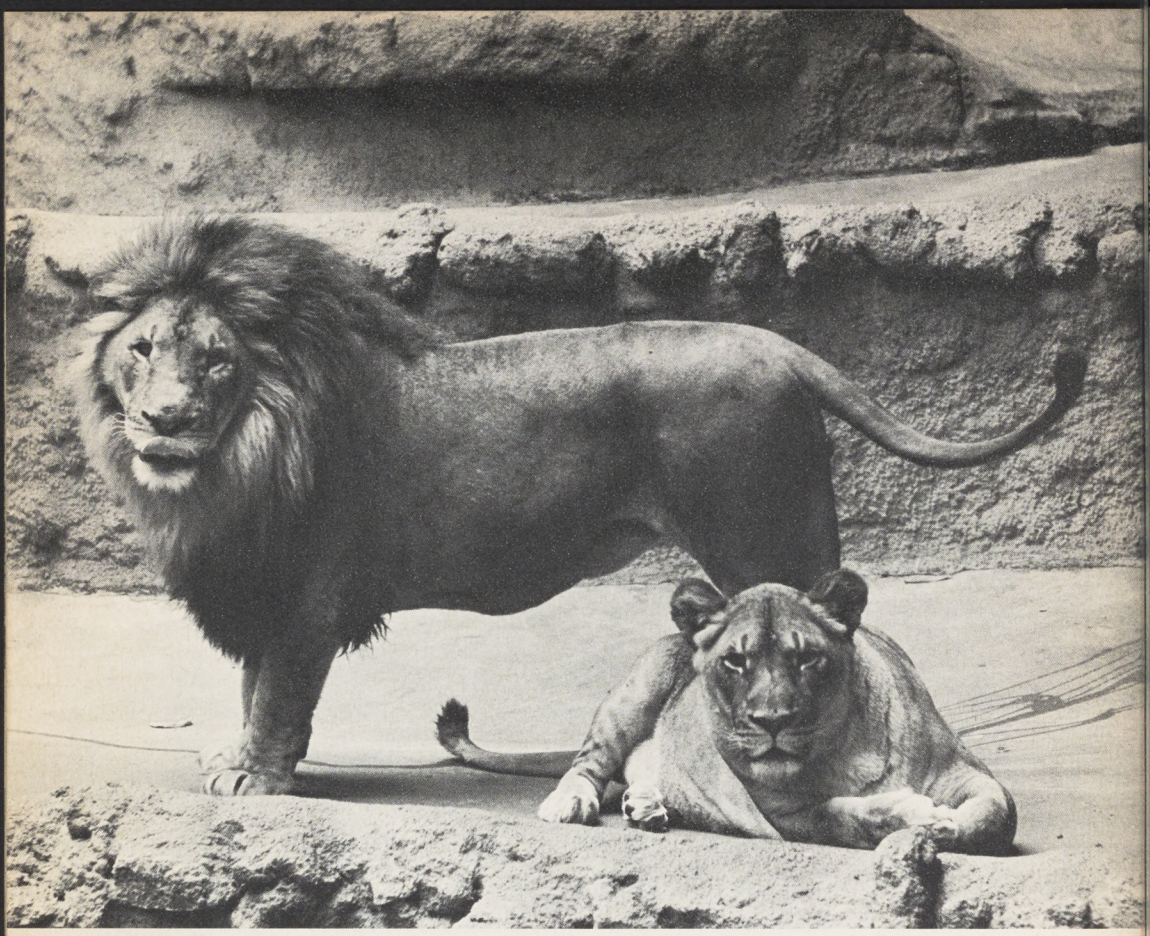
The Children's Zoo has joined its parent institution as another valued teaching tool for our public, parochial and private schools. During the school year any organized group of day-school children from pre-kindergarten through the sixth grade is admitted free-of-charge.

**DESERT TORTOISE pen**

**In the BURROWING RODENTS Grotto**

# MAMMALS

MATSCHIE'S TREE KANGAROO—
New Guinea



**AFRICAN LION**

When a zoo visitor asks, "Which way to the animals?" he almost invariably means, "Which way to the mammals?" Contrary to common usage, "animal" refers to any non-vegetable being from a microscopic, single-celled creature to man. Mammals are a restricted group of animals that possess hair at some stage of their development and nourish their young by means of milk glands. With only two exceptions, the Echidna and Duckbill Platypus of Australasia, all mammals produce their young through a birth process rather than by means of an incubated egg. Because of adaptations to many different ways of life, all sorts of diverse creatures are found within the group: whales and porpoises, seals, hoofed mammals, carnivores, flying mammals, and even man. Like birds, mammals originated from reptiles some 160 million years ago. Eighteen major groups, known as "orders," are generally recognized today, and the geologic strata are littered with remains of many others that for one reason or another failed to pass Nature's rigid tests for survival.

ECHIDNA — Australia

## Egg-laying Mammals:
### *Monotremata*

Among Nature's most paradoxical creatures are the **Echidnas** and **Platypuses** of Australasia. As survivors of the very earliest mammalian life, they retain many characteristics of their reptilian ancestors. Most striking is their method of reproduction—by means of a shelled egg, rather than through a birth process.

Superficially resembling a porcupine, the **Echidna** occurs in jungles, open forests and rocky scrub land of Australia, Tasmania and New Guinea. Teeth are absent, and the diet is composed almost entirely of ants, which it procures by means of a sticky, prehensile tongue after overturning rocks and logs.

One egg is produced, usually in September. It is carried in an abdominal pouch until hatched. After hatching, the young Echidna also is carried for a time in the pouch, while it nurses from a secretion exuding from the mother's milk glands.

## Pouched Mammals:
### *Marsupialia*

The marsupials (pouched mammals) form a primitive order of mammals, most members of which occur today in Australia and adjacent islands. Included in this group are many unique forms: the koalas, wombats, kangaroos, wallaroos, wallabies, our own native opossum, and many others.

Marsupials exhibit many peculiarities; most interesting, perhaps, are those concerned with reproduction and birth. The young are born in an underdeveloped state after a very short growth period in the body of the mother. In the case of the **Virginia Opossum** this growth period is only 13 days, and the newborn young are smaller than honey bees. In the case of most species the babies, immediately after birth, crawl into a pouch present on the abdomen of the mother, where they undergo several months additional development. Even in the few species where the pouch is vestigal or lacking there are always present two slender pouch supporting rods known as "epipubic" bones. These bones are not found in higher mammal groups.

Comparatively low in intelligence marsupials may have become extinct in most parts of the world because of their inability to compete with brainier, more progressive mammals. Their abundance in Australia may be attributed to their early arrival there when that continent was still part of the Asiatic mainland. Subsequent submergence and isolation prevented invasion by more advanced mammals, hence these early marsupials were able to spread out into various environmental situations and evolve into types that closely paralleled mammals of other groups found throughout the world. Thus we have mouse-like, mole-like, wolf-like, cat-like, and other forms that resemble non-marsupials.

The Zoo's marsupial collection contains many rare and interesting species. The **Tasmanian Devil** is a small, somewhat ungainly appearing flesh eater confined to the island of Tasmania. Though not active by nature, it more than makes up for this

TASMANIAN DEVIL

deficiency by strength and cunning. It is noted for its extremely powerful jaws. Natural prey consists of wallabies, ground birds and lizards.

Perhaps the most popular of all pouched animals is the **Koala,** the living prototype of the teddy bear. This appealing little "Aussie" feeds only on the leaves of the Eucalyptus tree, many species of which are grown in the Zoo grounds. Koalas spend most of their lives in trees, rarely descending to the ground during the day. In their slow, deliberate movements they resemble the sloths of the American tropics. The Zoo's Koalas were presented as a permanent gift and goodwill gesture from the people of Australia to the U. S. Marine Corps, to be housed in the Zoo as Marine "Mascots." Sir Edward Hallstrom, Director of the Taronga Zoological Park Trust in Sydney, Australia, and a long-time friend of the San Diego Zoo, was instrumental in arranging this magnificent gift.

The Zoo's spacious Koala sanctuary, built on a design suggested by Sir Edward, is dry-moated and contains a Eucalyptus grove. The fact that two Koala babies have been born there indicates that a happy substitute for the Australian "brush" has been provided. They are the first captive-bred Koalas reared outside of Australia.

The marsupial counterpart of the woodchuck is the wombat, several types of which are found in southeastern Australia, Tasmania and adjacent islands. The **Southern Hairy-nosed Wombat** is confined to the southern half of South Australia. It is distinguished by its hairy muzzle, soft fur and longer, more pointed ears. Wombats are burrowing animals. They subsist entirely on vegetation: grasses, roots and bulbs. In appearance they somewhat resemble small bears.

The typical kangaroos and their allies are characterized by long, powerful hind limbs well adapted to hopping, and a stout tail that is used as a prop while the animal is sitting. Almost all members of this group are plant eaters and occupy the position among marsupials that is filled by deer and antelope of other countries.

The **Tasmanian Gray Kangaroo** reaches a length of almost 10 feet and may weigh more than 200 pounds. Jumps more than 10 feet high and 27 feet long have been recorded for this species. In addition to the Tasmanian form, which prefers thick brush, other races of the gray kangaroo are found in open forest country in Australia and on Kangaroo Island. The **Red Kangaroo** is another large species occurring in the inner, dry plains region of Australia. It is more gracefully formed than the gray species. A "blue" phase occurs commonly among red kangaroos. These animals are sometimes mistaken for the true gray kangaroos but may be distinguished from the latter by a well marked black whisker mark on each side of the nostrils. **Wallaroos** are medium-sized kangaroos with short stocky limbs. They are sometimes called "Rock Kangaroos" because of their preference for rugged rocky terrain. Wallaroos are confined to Australia.

Wallabies are small members of the kangaroo family. Many species occur in Australia, Tasmania and adjacent islands. The **Agile Wallaby** has an extensive range along swamp thickets and streams of northern Australia. One race occurs in southern New Guinea. **Bennett's Wallaby** is a dark, thick-furred form found on Tasmania. The **Quokka** is a miniature kangaroo native to western Australia.

Tree kangaroos are among the most remarkable of all members of the 'roo clan. Inhabiting the tropical forests of northern Australia and New Guinea, they have descended from ground-dwelling ancestors but ascended to an arboreal existence. During this exchange of habitat, they have acquired better developed forelimbs, large hands with powerful claws equipped for climbing, and granular "non-skid" footpads. **Matschie's Tree Kangaroo** has been bred and reared in San Diego, a first record outside of Australasia.

**KOALA — eastern Australia**

# POUCHED MAMMALS

## Insect-eating Mammals:
*Insectivora*

The insectivores, or insect eaters, form a diverse group of mammals having a widespread distribution throughout most of the world except the Australian region. Members of this order are usually small, have elongated, pointed muzzles and very small eyes. Five toes usually are present on both fore and hind feet, and the entire sole of the foot contacts the ground in walking. It is believed that all higher groups of mammals evolved from ancient members of this interesting order. Shrews and common garden moles are familiar examples of insectivores found in the United States.

The **European Hedgehog** is a rat-sized member of the group native to the British Isles and western Europe. Although covered with spines it must not be confused with the larger porcupine which is a member of the rodent order. When alarmed the hedgehog rolls itself into a tight ball causing the spines to project in all directions. Most carnivores leave this little ball of needles strictly alone and hunt easier-to-eat prey. Hedgehogs feed on worms, slugs, lizards and the like. Many species are found in Africa, Europe and Asia.

## Lemurs, Monkeys, Apes:
*Primates*

To scientist and layman alike the primate order holds special appeal since, in addition to including monkeys and apes, it is the category that contains man, himself.

Essentially arboreal in habit, most members of this order live in the tropical forests of both the Old and New Worlds. They are characterized by having a brain that may attain great size and a high level of development, grasping hands and feet that are equipped with flattened nails instead of claws on at least some of the digits, and a collarbone. A menstrual cycle commonly occurs in this group.

The Zoo's collection, usually numbering at least sixty forms, has long been recognized as one of the outstanding primate exhibits in the world. Many species extremely difficult to maintain in captivity have lived here for many years and have produced young as well.

Among the primitive members of this order are the lorises of southeastern Asia, the galagos of Africa, and the lemurs of Madagascar. The **Slow Loris** of southeastern Asia and nearby islands is a thickly-furred, stocky little animal weighing about

**SLOW LORIS — southeast Asia**

a pound. Its large eyes are indicative of its nocturnal habits. Slow and deliberate in movement, the loris seldom if ever leaves the protection of its beloved trees. The day is spent asleep; at night it fares forth in search of favorite fruits, insects, and occasional bird eggs. Geckos (a kind of lizard) are especially relished when the loris is lucky enough to catch them. The **Lesser Galago,** or **Bush-baby,** is a small, long-tailed member of the loris group native to the African bush.

Lemurs differ from lorises in many details; most noticeably, perhaps, in the proportionately greater length of the hind legs compared with the forelimbs. All limbs of the loris are about the same length. The facial region of the lemur also is noticeably longer, hence a more pronounced muzzle is evident. These animals are confined to Madagascar and the adjacent Comoro Islands. The **Fulvous Lemur** and the **Black Lemur** are small, cat-sized animals that occur in forested areas in small parties. Their food consists mainly of figs and plaintains. Most kinds of lemur are nocturnal.

The more advanced primates, monkeys, apes and man, have a much larger and more complicated brain than the foregoing forms. Although most of them walk on all fours, there is a great tendency towards an upright sitting posture which frees the hands for manipulating objects.

New World monkeys differ from their Old World contemporaries in many respects. Perhaps the easiest way to distinguish between them is by the nose. The nostrils of New World monkeys are directed outward and the openings are separated by a very wide partition. In Old World forms the openings are directed downward while the separating partition is usually quite narrow. None of the American species are equipped with cheek pouches for food storage or have bare calloused areas on the buttocks. These characteristics are common to Old World forms. Many, but not all, American species are equipped with a grasping tail that is used as a fifth hand. None of the Old World forms have this type of tail. All

**UAKARI — upper Amazon**

Old World species have 32 teeth, the same number that is found in man.

There are two families of New World monkeys, Cebidae and Hapalidae. The familiar capuchins, howlers, squirrel and spider monkeys, sakis and others belong to the family Cebidae. These monkeys have a total of 36 teeth and have nails instead of claws on all fingers and toes. It is only here that the prehensile (grasping) type of tail occurs and, even within the family, some species do not have this type of organ. The **Night Monkey,** a nocturnal form ranging from Nicaragua to northeastern Argentina, is a good example of the non-prehensile-tailed type. Another is the **Red Uakari,** representing a group of monkeys restricted to the upper reaches of the Amazon drainage system. The bizarre uakaris inhabit humid equatorial jungles and are extremely difficult to maintain in captivity. The Red Uakari is characterized by a relatively short tail, a cloak of coarse reddish hair draping a thin spidery body. Its skull-like face is bright red and deepens in color when the animal becomes excited or angry. The sakis likewise possess non-prehensile tails and dwell in the dense rain forests of South America. They are shaggy little animals with brushy tails. Not overly common in the wild, they are rare in zoos and in general do not thrive in captivity. A **Black Saki** from British Guiana established a longevity record by living in the Zoo for 15 years.

The **Golden-headed Saki** from the forests of the Rio Hondo has bred and reared young here. One of the most captivating members of the family is the **Squirrel Monkey.** Inquisitive and gentle, these little animals gather in large groups to frolic and play through the forests of Central and South America. Where they occur they are usually the most numerous of any species of monkey in the area.

Among prehensile-tailed monkeys, several species of capuchins are always to be seen in the collection. The familiar "organ-grinder" monkeys, they range widely from Nicaragua to southern Brazil. Their habit of carrying their prehensile tails rolled in a loose ring when not in use has earned them the name "ringtail." A **Hooded Capuchin** has lived in the Zoo for over 35 years and holds the longevity record for all species of capuchins. His age at the time of arrival is unknown. Hooded Capuchins range through the Guianas of northern South America.

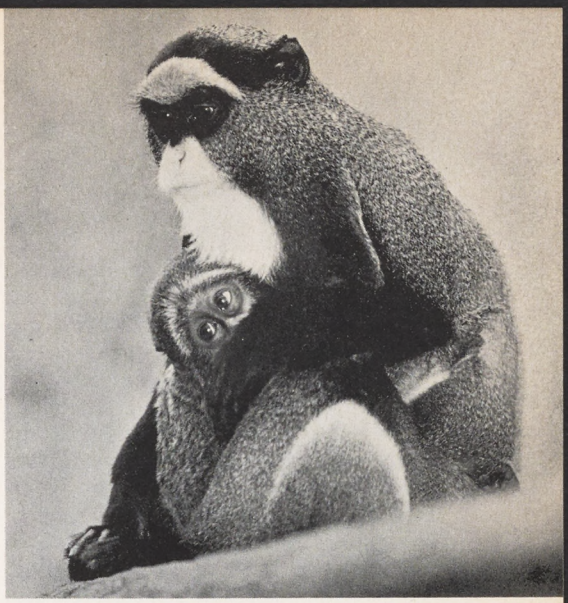
The most fantastic and clownish of the American primates are the long-armed spider monkeys whose generic name, *Ateles*, means imperfect, referring to the fact that they lack thumbs. Their strong prehensile tails are equipped with a hairless, "non-skid" area on the under side that aids in grasping limbs as they race through the trees. There are many varieties of spider monkeys ranging from southern Mexico south to northern Matto Grosso, Brazil. They are considered very good to eat by the natives of many countries they inhabit. Many forms are exhibited here, the **Black** from northern South America and the **Central American** are examples. **Humboldt's Woolly Monkey** from the upper Amazon, Colombia and Peru resembles the spider monkeys but is stocky, has thumbs, and possesses a dense, plushy coat.

The family Hapalidae includes the marmosets and tamarins. Members of this family have nails on the great toes only. The rest of the digits are provided with sharp claws. The number of teeth has been reduced to 32. In most cases twins are produced at birth, and in some species the father assists in the care of the young by carrying them about except during the time they are engaged in nursing. All varieties are small. The tiniest, the **Pigmy Marmoset** from Brazil, Peru, and Ecuador, weighs less than five ounces when fully grown **Geoffroy's Tamarin** inhabits Central America from Costa Rica to Panama. The splendid **Lion Tamarin** or **Golden Marmoset** of southeastern Brazil boasts a silky golden pelage and a thick mane. Characteristic is the disproportionate length of the hand which nearly equals that of the forearm. This species was mentioned in writings of New World explorers as early as 1551.

The vast array of Old World monkeys are included in two families, the Cercopithecidae and the Colobidae. Both groups have African and Asiatic representatives. Their distinction is not always easy. Members of the first family possess cheek pouches, have arms and legs nearly equal in length and simple stomachs. The tails are variable in length and in some cases are nearly non-existent. Included here are the macaques, mangabeys, baboons, guenons and others.

Many species of macaques are on display at the Zoo. In general these monkeys are characterized by having stout compact bodies, relatively short limbs, and close-set eyes surmounted by heavy brow ridges. The elongated snout is responsible for the name "macaque" which in French means "dog-faced monkey." With the exception of the **Barbary "Ape,"** or **Magot,** which occurs in North Africa and Gibraltar, all macaques are Asiatic in distribution. Tail-length varies from one species of macaque to another: the black-bodied, gray-ruffed **Lion-tailed Macaque** of the Indian Peninsula has a long tasseled tail, the **Stump-tailed** and **Japanese Macaques** are nearly tailless, while the Malaysian **Pig-tailed Macaque** has a short arched curlicue. The rare jet-black **Crested "Ape"** from Celebes seems, in many respects, to be intermediate between the macaques and baboons; however, the nostrils open at some distance behind the end of the snout instead of at the tip as in the true baboons.

**LION-TAILED MACAQUE — India**



**DEBRAZZA GUENON — equatorial Africa**

The mangabeys are slender, long-tailed monkeys confined to equatorial Africa. They have silky coats and startling white eyelids. The **Golden-bellied Mangabey** and the jet black **Peaked Mangabey** are two rarely-exhibited forms from the Congo Basin. The **White-collared,** or "**Cherry-head,**" is one of the most handsomely-marked members. Most mangabeys are almost exclusively arboreal.

Guenons constitute the largest group of primates; more than 80 forms have been described. Distributed throughout Africa south of the Sahara, they are long-tailed, short-limbed, and range in size from medium to small. Most species are basically olive or yellowish, but many are handsomely marked and some are richly colored. **Spot-nosed** and **Moustached Guenons** are so named because of white facial markings, while the **Debrazza** boasts a fine set of white mutton-chop whiskers. In addition to a pointed goatee, the lovely **Diana** has a crescent of white on the forehead, symbol of Diana, the Moon Goddess. **L'Hoest's Guenon** has a full white ruff and **Hamlyn's Guenon** is blackish with a vertical white streak between its nostrils. All of these species as well as the yellowish **Talapoin,** smallest of the group, inhabit dense equatorial forests. To the contrary, most members of the **Green Guenon** group prefer drier, more open forest and bush.

Allied to the guenons is the white and carrot-red **Patas.** Primarily a ground-dweller, this lithe long-legged creature occurs in savannah country from East Africa to Senegal.

The swamps of the central Congo Basin are inhabited by a rare and little known monkey that has no really acceptable common name. It has been called **Allen's Baboon-like Monkey,** which is extremely misleading for it is a small creature, very guenon-like in appearance. In addition to more customary monkey fare, it feeds on snails, shrimps, and small fish. This monkey is very fond of water.

The baboon clan is chiefly African and includes the largest of all monkeys. Typical baboons may be distinguished from other monkeys by their size and also by their dog-like snouts which are far more pronounced than those of the macaques. These fearless creatures usually are quite dangerous upon reaching maturity. They are extremely erratic and will fly into fits of rage over the simplest of incidents. Baboons roam in large packs and will feed on anything that is edible. Unlike most primates, they are chiefly ground dwellers

and prefer rocky terrain. The **Chacma** is a solidly-built baboon from South Africa. The general color of the shaggy coat is grayish-black. The name "Chacma" is derived from its Hottentot designation "T'chackamma." The **Long-armed Baboon** is distinguished by the pale brownish-yellow hue of the fur. This species has a rather extensive range in eastern Africa. The **Anubis, Doguera,** or **Dog-faced Baboon,** is an olive-green-coated animal found in East Africa, the Sudan, and the Congo, while the smaller **Guinea Baboon** inhabits central western Africa. The **Gelada** is a rarely-exhibited baboon-like monkey inhabiting the mountains of Abyssinia, usually above 6,000 feet. It has a heavy dark mane and a naked red area on the chest. The Gelada has nostrils that are situated farther back on the muzzle instead of at the tip, as in the true baboons. The **Hamadryas,** or **Sacred Baboon,** is a pale gray species that inhabits North Africa and Arabia. The large mane covering the neck and shoulders, and the flesh-colored face and ears, are characteristic. This baboon was considered sacred by the ancient Egyptians and was consecrated to their god, Thoth. Hermapolis, the city of Thoth, was especially devoted to the cult of these animals. The nearly tailless **Mandrill** from West Africa is characterized by its huge size and highly colored muzzle. This organ has prominent rib-like swellings brilliantly colored with blues, purples and red. The **Drill** somewhat resembles the Mandrill but has a black muzzle. This baboon is found in north Cameroon.

Members of the family Colobidae are characterized by their lanky build, long tails, longer legs than arms, and absence of cheek pouches. The stomach is divided into a number of pouches or sacs instead of being a simple bladder-like organ as is

**ALLEN'S MONKEY — Congo Basin**

**PROBOSCIS MONKEY — Borneo**

the case in all other primates. Included in this family are the langurs and **Proboscis Monkey** of Asia and the African Colobus, or "thumbless," monkeys.

The rarest mammalian species in our collection is the grotesque **Proboscis Monkey,** native of Borneo. It is characterized by a large, fleshy nose that in old males is said to reach a length of more than three inches. One individual of this species lived in the Zoo for more than four years, well exceeding the few captive longevity records of this species in other collections. This represents the first successful attempt to bring Proboscis Monkeys alive into the Western Hemisphere. In their native haunts, these monkeys are invariably found in low, swampy areas or along waterways. They swim well and not infrequently resort to this form of locomotion as a means of escape.

The leaf-eating monkeys have slender bodies, long limbs and, in most cases, long tails. Although their diet consists chiefly of leaves, they also feed on fruits and blossoms. Most of these monkeys are delicate

**NILGIRI LANGUR — India**

**KIKUYU COLOBUS — East Africa**

and not often exhibited. The **Kikuyu Colobus** inhabits the mountains of Kenya, East Africa. This long-coated species is black with a white fringe about the face, long white mantle and a white tasseled tail. Several young ones, which are born white, have been bred and reared here.

Of the Asiatic langurs, the best known species is the **Entellus Langur** of India. This large gray monkey is considered sacred and often is seen in a semi-domesticated state around temples. Other langurs, less commonly exhibited in zoos, that have been shown here include the **Pileated**

**Langur** of Assam, the **Nilgiri Langur** of peninsular India, the **Silvered Leaf Monkey** of Indonesia, and the **Spectacled Langur** of Malaya.

The apes include the gibbons, orang-utans, chimpanzees and gorillas. The latter three groups are customarily known as anthropoid, or manlike, apes. None of the members of this family have external tails. In all cases the arms are longer than the legs, and the chest is more-or-less flattened from back to front. The apes are the most manlike in appearance of any of the primates. All have a total of 32 teeth, the same as man and the Old World monkeys. Gibbons and orang-utans are confined to southeastern Asia and the East Indies, while chimpanzees and gorillas are found only in equatorial Africa.

Gibbons are the smallest of the apes, the least intelligent, and, perhaps, the greatest acrobats of all living animals. The scientific name *Hylobates* means tree-walker, which is appropriate, since they spend most of their time high in the trees. When they do descend to the ground or walk along large limbs, they have the most erect carriage of any of the apes, walking fully erect with their arms extended high above their heads. Gibbons have extremely long arms that easily reach the ground when they stand erect. In contrast to the anthropoid apes they have small bare rump patches known as "callosities."

These primates are found in tropical Asia, Indo- and Cochin China to the tip of Malaya, as well as on some of the Indonesian Islands. They also range west into India. In their native haunts they occur in small family groups, each group ranging over a territory of many acres. They use regular trails among the trees and will fiercely defend their territory from encroachment by neighboring groups. The classification of gibbons is confusing since color phases occur which in the past were given separate names. Subsequent studies proved, however, that black, gold, cream and other colored individuals were merely individual variants which could occur within the same group. Six species are currently recognized. Representatives of all have been exhibited here. The **White-handed Gibbon,** ranging from Siam south through Malaya to Sumatra, usually is black or blackish-brown. The hands are whitish-buff, and a white ring surrounds the face. Pale specimens often occur. The **Siamang,** occuring in Tenasserim, Malaya, and Sumatra, is a large black gibbon distinguished by the fact that the second and third toes are enclosed in a common web of skin. It is further distinguished by the presence of an inflatable throat sac which serves as a vocal resonating chamber.

The range of the **Orang-utan** is entirely confined to the islands of Borneo and Sumatra. In common with the other two groups of manlike apes the orangs possess a high degree of intelligence and are believed by some authorities to more nearly approach man in this respect than either the chimpanzee or the gorilla.

In zoos these apes prove to be quite clever with tools and seem to be natural engineers. They are systematically destructive to their cages, hence great care must be used in the construction of every fea-

**SIAMANG — Sumatra and Malaya**

**ORANG-UTAN — Sumatra and Borneo**

ture. Patience seems to be their greatest attribute, and it is in this characteristic that they contrast most strongly with the tempermental chimpanzees. The name "orang-utan" means "man-of-the-woods" in native tongue and well describes this forest dwelling primate. The long, coarse body hair is reddish-brown in color, ranging from sorrel to deep auburn. Adult males develop high cheek pads that extend out from the face giving a curious Buddha-like appearance to the animal. The average weight of wild males is about 165 pounds, but a giant specimen that lived many years at the San Diego Zoo reached the amazing weight of 335 pounds. Females average much smaller. The average height of the male is 4½ feet.

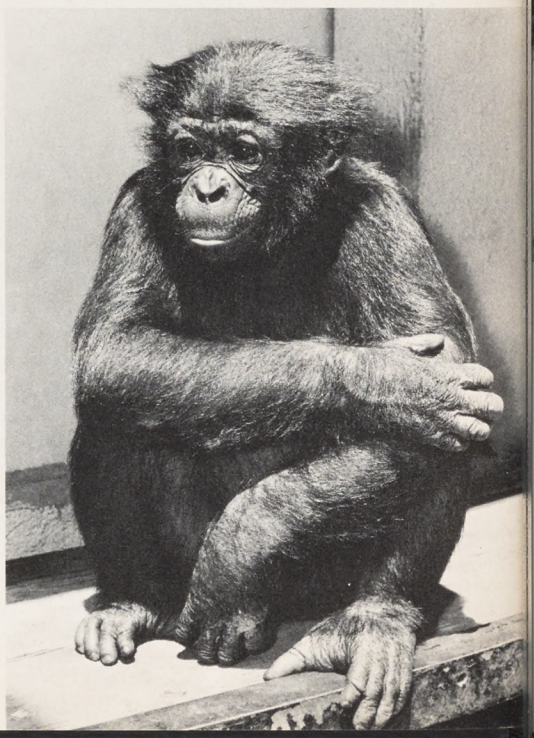
Like gibbons, orangs spend most of the time above the ground but, whereas the gibbon races through the trees performing all sorts of aerial gymnastics, the orang proceeds with caution, testing each limb before trusting it to hold its weight. At night substantial nests are constructed high in the trees. On the ground the gait is a shambling, whirling sort of walk in which the long arms are used as crutches. The extremely short legs of the orang contrast noticeably with the long arms.

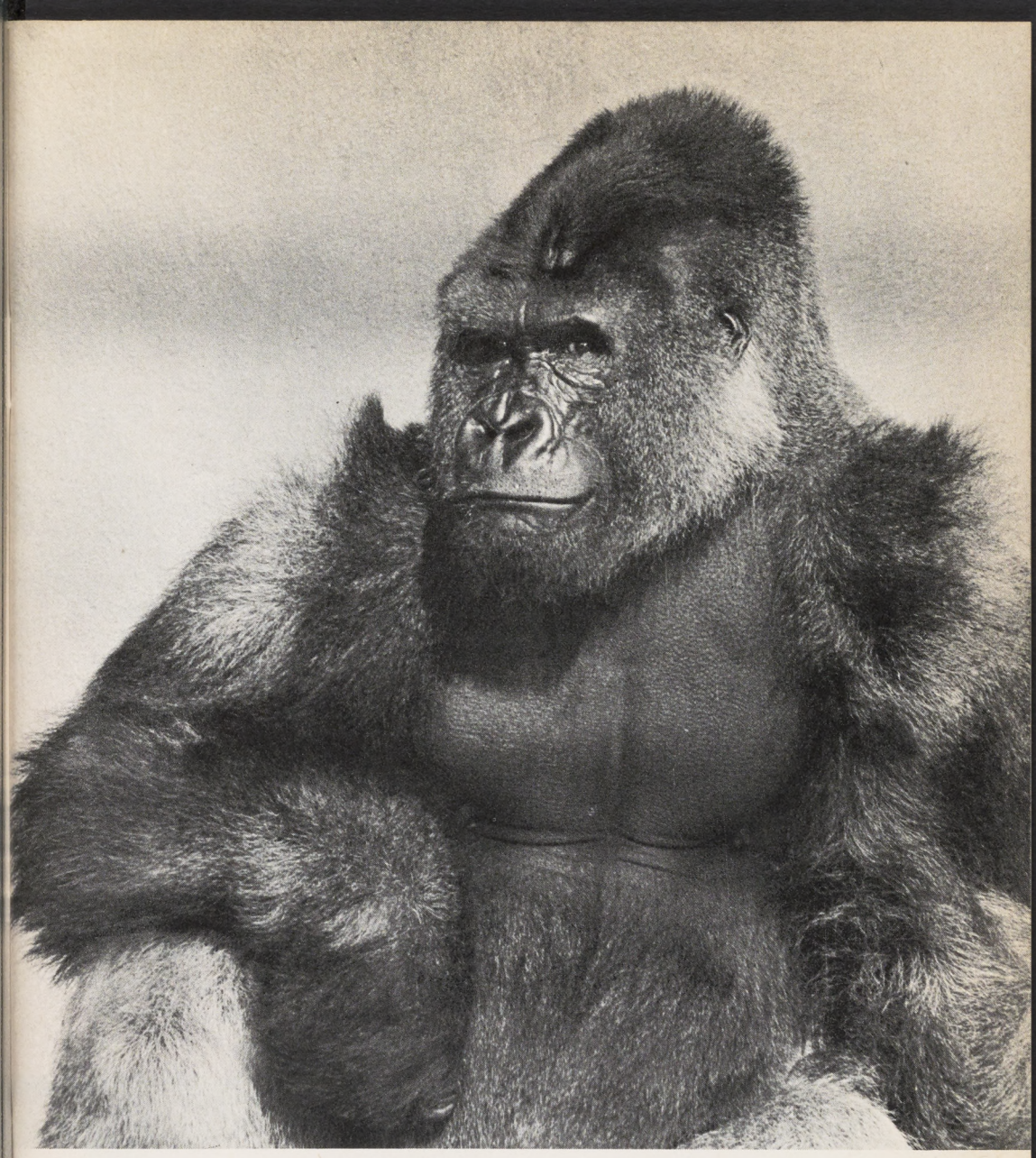
The chimpanzee of equatorial Africa has been used extensively in behavior studies and is the best known of the great apes. More manlike in appearance than the orang, the chimp may stand five feet high and weigh up to 175 pounds. The coat is composed of long, coarse hairs predominantly black in color. Chimps are highly intelligent and appealing when young. As adults they almost invariably become erratic and dangerous. In the wild they are much more at home on the ground than in the trees, although they can and do climb readily. They usually associate in groups of from four to fourteen individuals of both sexes and all ages and, unlike gibbons, do not stay within limits of definite territories, but tend instead to wander at random over a rather large area. At night they sleep in tree nests constructed at varying heights above the ground.

In the Zoo chimps breed and produce young readily. Three generations are exhibited here in one enclosure.

One of the least known members of the ape family is the **Pygmy Chimpanzee,** or

**PYGMY CHIMPANZEE — Congo Basin**





**LOWLAND GORILLA — western equatorial Africa**

**Bonobo.** This diminutive chimp is restricted to swampy forests on the south bank of the middle Congo River and is seldom seen in zoos. Only half the size of other forms of chimpanzee, the Pygmy Chimp is further characterized by a more spherical skull, a slender body, and the partial joining of the second and third toes by a common web.

Gorillas are unquestionably the most impressive of all primates, as well as being among the most valuable of all specimens. They are worth at least five thousand dollars when purchased as babies, and their

value skyrockets as they begin to mature. Two categories usually are recognized: the **Lowland Gorilla** of Gaboon, Cameroons, French Equatorial Africa, and eastern Nigeria, and the **Mountain Gorilla** of eastern Congo region and western Uganda. The mountain form is somewhat the larger of the two and is characterized by a conspicuous crest on the head. Two male Mountain Gorillas in the Zoo attained weights of over six hundred pounds each. These are the two largest gorillas ever recorded. Mbongo, the younger, died after ten-and-a-half years in the Zoo and weighed 618 pounds. Ngagi, somewhat older, reached a weight of 635 pounds. They were captured by the Martin Johnsons in 1930 and were estimated to be between four and five years old.

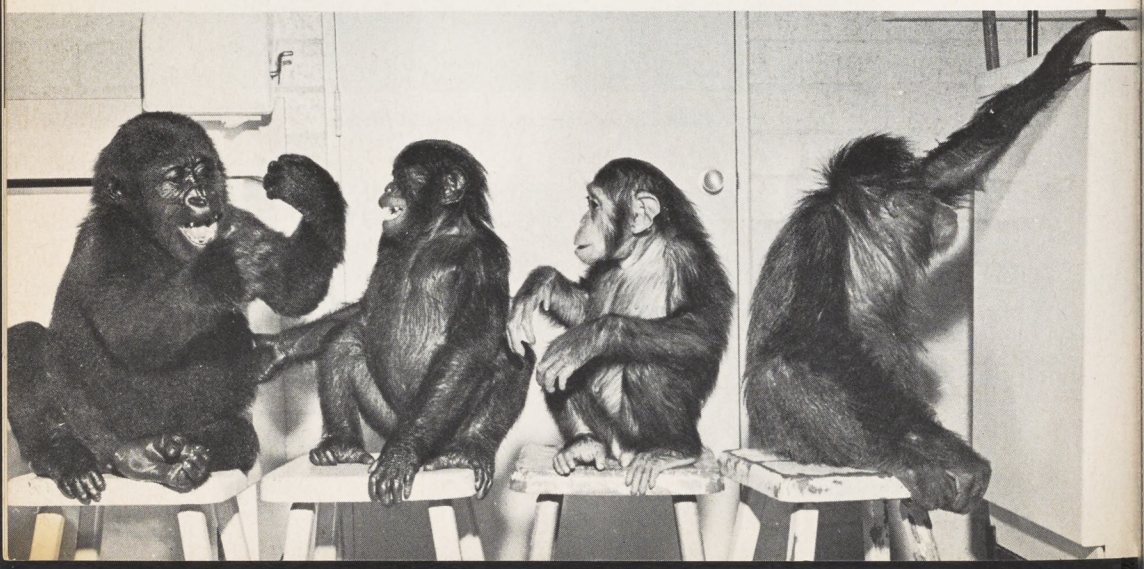
In 1949 three infant **Lowland Gorillas** were obtained from the French Cameroons with special permission of the French Government. They were all under a year old at the time and weighed between six and eight pounds each. From their infancy, they have been under continuous observation by trained psychologists who are studying their intelligence and learning capacity. Since 1949 several other Lowland Gorillas have been added to the San Diego Zoo colony.

Gorillas, like chimps, usually walk on all fours when on the ground. Due to their tremendous size when adult, they spend most of their time at or near ground level. The young, however, are excellent climbers. When on all fours they bear their weight on the second joints of their fingers and the soles of their feet. The feet are much less flexible than those of the chimp, and both hands and feet are more in proportion to those of man. When gorillas do stand erect they stand very straight, carrying their arms at their sides and stepping on the flat of the foot.

As in the case of most primates, the bulk of the gorilla diet is of vegetable origin, including leaves, shoots, bark, fruits, seeds and nuts.

The aspect of gorilla behavior that most intrigues visitors is that of chest-beating. Although popular literature usually attributes this gesture to anger or alarm, it actually is an expression of exuberance. Only when gorillas are in the best of spirits do they beat their chests. This usually is done with cupped hands which add resonance to the drumming. The sound may serve as a signal by which members of a gorilla troop retain contact with one another in the deep jungle. Vocally, gorillas are rather quiet creatures; although they do have a wide variety of vocalizations should they feel inclined to use them. In voice, and temperament as well, they are much less erratic and hysterical than their African relatives, the chimpanzees. Their quiet reserve and innate dignity place them on a level far above the other so-called "lower" primates.

**Young Apes, GORILLA, PIGMY CHIMPANZEE, CHIMPANZEE, ORANG-UTAN**



GREAT ANTEATER — tropical America

## Anteaters, Sloths and Armadillos: *Edentata*

These animals comprise an order confined to the Western Hemisphere. While all members lack incisor and canine teeth, the anteaters are entirely toothless. Cheek teeth, in such species as possess them, lack enamel. Only one form, the **Nine-banded Armadillo,** occurs north of the southern border of the United States. The **Great Anteater,** ranging from Costa Rica through the tropics of Central and South America, is a coarse-haired animal with a length of seven feet, about half of which is devoted to tail. A long tubular muzzle is equipped with a small terminal opening through which a greatly elongated and sticky tongue can be extended to capture ants and termites. Powerful forelegs and claws are used to tear open termite nests. The **Lesser Anteater** is arboreal and has a prehensile tail.

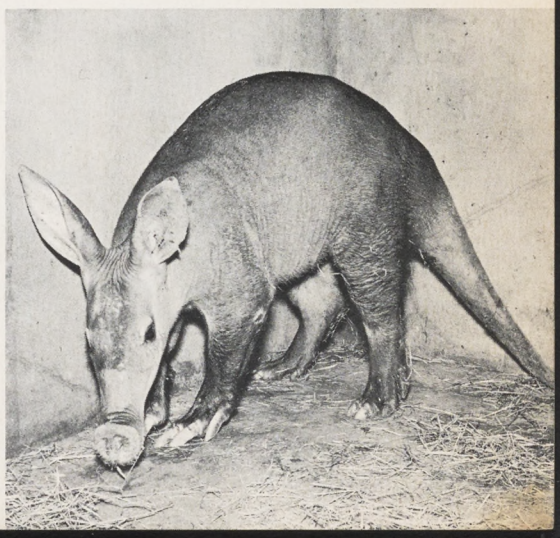
## Aardvark: *Tubulidentata*

The **Aardvark** is the sole representative of an order restricted to Africa, alphabet books, and crossword puzzles. Resembling American anteaters, it has a tubular snout, reduced dentition, strong feet and claws, and a long tapering tail. In addition, it has large upright ears. It may weigh as much as 140 pounds. Its Dutch name means "earth hog," but it also is known as an "Ant Bear." It is nocturnal and lives in burrows.

## Rodents: *Rodentia*

Thirty-two families of rodents are currently recognized in this order, which far exceeds the number of species and individuals of all other orders of mammals combined. They range from small mice weighing less than an ounce to the Capybara that tips the scales at close to 100 pounds. In adaptations to various environmental situations the rodents present a bewildering variety. Some, the flying squirrels, have skin membranes that enable them to glide from tree to tree. The kangaroo rats of southwestern United States have elongated hind legs by means of which they are able to take tremendous leaps. Some (the beaver and the muskrat) are specialized for a semi-aquatic existence; while others, such as the pocket gopher, have become modified for an underground life.

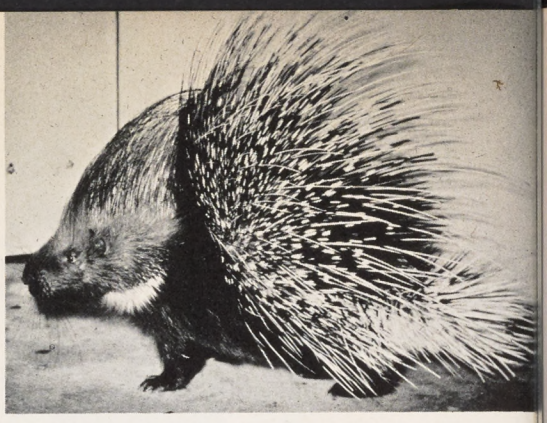
AARDVARK — Africa



It is said that a rodent is a rodent because it gnaws. All rodents possess two long upper and lower "gnawing" incisor teeth that grow continuously throughout the life of the animal. These teeth are peculiar in that enamel is present only on the front surface. Thus, as the teeth are worn down by use, a sharp chisel-like edge always is maintained, since the softer dentine of the back surface wears away faster. No canine teeth are present. This leaves a wide open space between the incisors and cheek teeth. In no case does the total number of teeth exceed twenty-two.

Perhaps the most appealing of all rodents are the squirrels, several types of which are exhibited at the Zoo. The **Texas Fox Squirrel** is an introduced form that roams free on the grounds. The **Giant Tree Squirrel** and several species of tropical American tree squirrels usually are on display in the collection.

The porcupine is the second largest rodent found in North America, sometimes attaining a weight of forty pounds and being exceeded only by the beaver which may weigh as much as sixty pounds. Because of its sharp spines or quills, which are merely modified hairs, the porcupine is one of the best protected mammals in our forests. Dogs, pumas, and even wolverines have been known to attack these slow-moving clumsy rodents; but it is doubtful if these predators ever attempt this rather foolhardy task a second time, unless driven by extreme hunger. These animals may become pests in timber country, since a large portion of the diet is made up of the bark of pine, juniper, white firs and other trees. The story about the porcupine's ability to throw its quills is not founded in fact. After rough handling some of the quills may become loosened and tossed about as the animal struggles and thrashes with its tail. This could be the source of the above tale. The American **Yellow-haired Porcupine,** the enormous black and white **Crested Porcupine** of Africa, and the **Brush-tailed Porcupine** of southeastern Asia are exhibited here. The Old World porcupines, despite superficial resemblances to New World forms, are placed in a separate family.



**AFRICAN CRESTED PORCUPINE**

The Latin-American countries are inhabited by a number of distinctive rodents. Perhaps the most striking is the gigantic, semi-aquatic **Capybara,** which may reach a length of four feet and weigh up to 100 pounds. The Capybara inhabits the shores of lakes and rivers in Central and South America as far south as the Rio de la Plata and also is found in the lowlands of Peru and Bolivia. This rodent dives and swims with great ease and takes to the water at the first sign of danger. The commercial **Chinchilla** is native to the high Andes Mountains. These little rodents are found associating in large groups. They build extensive burrows in the barren hillsides and live on the scant vegetation, such as grasses, roots and moss found in these areas.

## Flesh-eating Mammals:
### *Carnivora*

This vast and diversified order includes the dogs, wolves, foxes, cats, weasels, badgers, and many other mammals that are adapted to catching and killing prey and eating meat. Some, the bears and raccoons for example, have deviated from a strictly flesh diet. Others, the hyenas, usually are content to feed on carrion and carcasses left by more aggressive predators. Also included in this order are the seals and walruses that have, to a large degree, forsaken a terrestrial existence in favor of a marine life. Because of these

modifications in food habits and other environmental adaptations, it is somewhat difficult to define the group as a whole. Most carnivores have rather small incisor teeth set in a transverse row between two large, sharp canines. As an aid in slicing through tough tendons and gristle, certain cheek teeth have blade-like modifications that permit a scissor-like shearing action while chewing. These teeth are called "carnassials" and are only found in the carnivores. The young in most species are helpless for some time after birth.

Fido's wild relatives are many and varied. Best known, perhaps, is the **Wolf** of North America, Europe, and Asia. This animal is still fairly common in Canada and Alaska but is almost extinct in the rest of the U.S. Wolves usually hunt in small family packs of up to a dozen individuals and may cover an area of from 20 to 60 miles in diameter. Food consists of fish, fruit, birds, rodents, deer and, in the north, caribou. Much maligned in story and song, the wolf leads an exemplary home life. The male brings food to his mate when she is denned up with a litter; the female plays an important role in the education of the cubs. Adult males in good condition usually weigh about 100 pounds, females slightly less. The little **Coyote** is a native of western United States and Mexico. Weighing only about 40 pounds, it is distinguished from the wolf by its small size, narrow nose pad, and its habit of running with the tail held down instead of high as does the wolf. This little animal is quite common in San Diego County. In Asia and North Africa, the ecological niche of the Coyote is filled by the similar **Golden Jackal.** The **Dingo** is a wild dog found in Australia, where it is believed to have been introduced by primitive man many thousands of years ago. This dog is the most destructive predator on the continent. Similarly, the origin of the **Hallstrom's,** or **New Guinea Wild Dog,** remains a mystery. The ancestors of this rare species, like those of the Dingo, were probably introduced by man.

**HALLSTROM'S WILD DOG — New Guinea**

**AFRICAN HUNTING DOG**

South America is inhabited by a number of rarely exhibited members of the dog family. The **Maned Wolf** is a stilt-legged denizen of the pampas of southern Brazil, Paraguay, and Argentina. The **Bush Dog** is a small, short-legged inhabitant of the deep jungles of northern South America. The first record of captive breeding and birth of this species was at the San Diego Zoo. The **African Hunting Dog** averages about 60 pounds in weight and is characterized by prominent rounded ears, a hyena-like stance, and large body patches of tan, black, and white. These dogs, though now scarce, formerly ran in packs throughout the greater part of Africa from Sudan to the Cape. In the South African Sabi Game Reserve a pack of over 70 individuals was reported ranging over an area of some 1,500 square miles. This predator, more than any other animal except man, has been responsible for the disappearance of the large game herds.

"Fox" is a term that is applied to various small members of the dog family, including the **Arctic Fox** of the far north and the **Red Fox** and **Gray Fox** of North America. The **Fennec** of North African deserts is especially noteworthy for its buff coloring, its minute size and its proportionately enormous ears. Another fox-like creature is the gray-bodied, black-masked **Raccoon Dog** of Japan and eastern Asia.

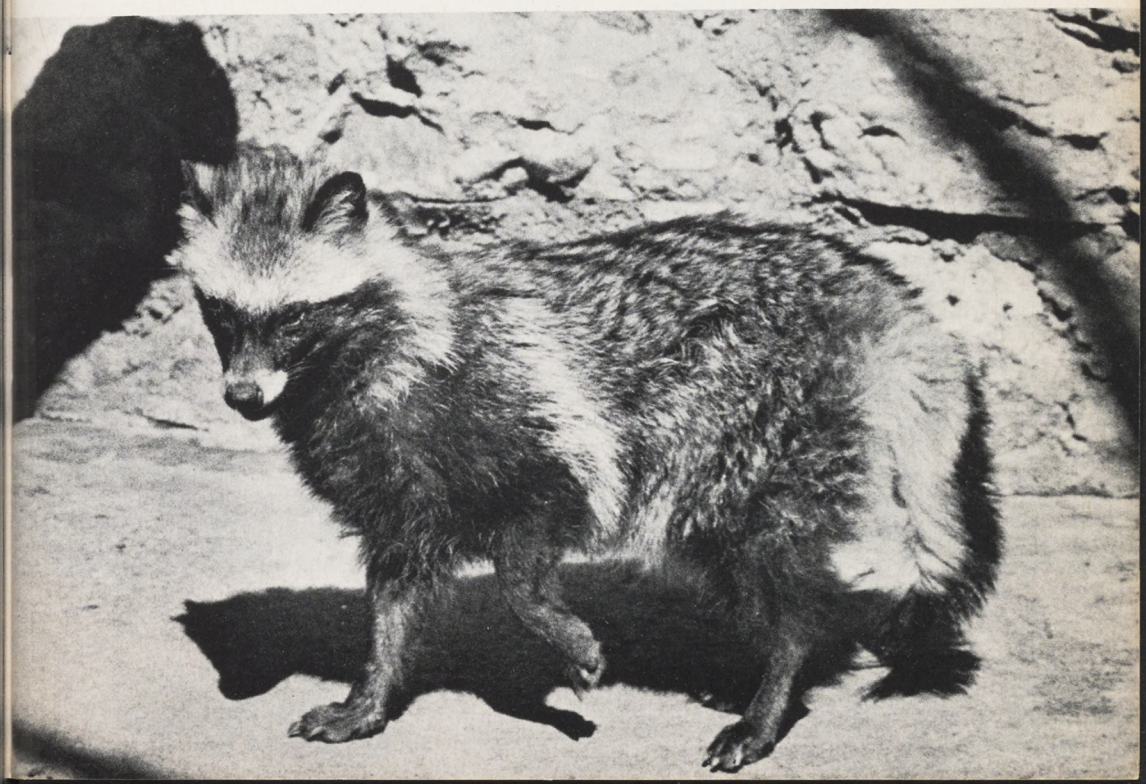
The bear family contains the largest land carnivores. They are distinguished by their extremely short tails, almost hidden in the body fur, and by the fact that they have a plantigrade walk (that is they walk on the entire sole of the foot as does man). Tubers, berries and other fruits are eaten to a much greater extent than is true in the case of other carnivores. Concurrent with this change in diet has occurred a modification of the cheek teeth into a crushing type unlike those of most other members of the order. Bears occur in North and South America, Europe and Asia. One reported from the Atlas Mountains of North Africa now seems extinct.

The only representative found in South America is the tiny **Spectacled Bear** which stands about 20 inches high at the shoulder and weighs about 150 pounds. This bear lives in the Andes of Peru and Colombia. Its coat is black, and the cream colored markings on the face are responsible for its name.

The brown bear group has a wide distribution. Some scientists have recognized as many as 76 species in North America. Best known member is the **Rocky Mountain Grizzly** which averages about 600 pounds in weight. In past years many species of grizzlies occurred in California, one of which is depicted on the state flag. This bear is now extinct in the state; the last record is of one killed in 1922 in Tulare County. One of the largest of all grizzlies, the **Southern California Grizzly** occurred in San Diego County several years ago. The weight of one large male of this species was estimated to be 1,400 pounds. The last of these giants was killed near Sunland, Los Angeles County, in 1916. The big brown bears of Alaska are the largest members of the bear family. The **Kodiak Bear** may reach a weight of over 1,600 pounds. The **Montague Island Bear** is a closely related form restricted to an island in Prince William Sound. The **Eurasian Brown Bear** has a wide range in Europe, Asia, and Japan. This is the type usually trained for circus acts.

The **American Black Bear** of North America has several color phases ranging from black through brown and gray to white. Best known of these is the so-called **Cinnamon Bear.**

**RACCOON DOG — eastern Asia**



**MONTAGUE ISLAND BROWN BEAR—Alaska**

The **Polar Bear** of the bleak wastelands of the far north has a circumpolar distribution. The males of this great white bear average about 900 pounds and have been reported at 1,600 pounds. In the wild, polar bears feed chiefly on seal meat and fish. They are excellent swimmers and are sometimes seen far from land.

Asia is inhabited by several black bears. The **Asiatic Black Bear** has a conspicuous ruff on the neck and a prominent white V on the chest. It occurs from China to India. The **Sloth Bear** occurs in southern India and Ceylon. The tubular snout has "vacuum-cleaner action" and is used to suck up grubs and termites. The well developed claws are useful in tearing open termite nests. This bear generally weighs between 200 and 250 pounds. The **Sun Bear** only weighs between 100 and 150 pounds and is the smallest of bears. Despite its size, it is powerful and has a savage disposition. It is native to Siam, Burma, Malaya and Borneo. Several species of bears have reared young in the Zoo. Among them are the Sun Bear, Eurasian Brown Bear, Rocky Mountain Grizzly, American Black Bear and Polar Bear.

The raccoon family has representatives in North America, South America and Asia. These mammals resemble the bears in their departure from a strict flesh diet, modifications of cheek teeth structure, and plantigrade walk. They are, however, of much smaller size and have long tails. All members of the group climb well. The

**SLOTH BEAR — India and Ceylon**

**AMERICAN OTTER — North America**

raccoons, of which there are several species, occur from Canada south into South America. The familiar **North American Raccoon** is characterized by its bushy ringed-tail and mask-like face markings. The **Kinkajou** is a large-eyed, prehensile-tailed animal found in Mexico and Central and South America.

The **Lesser Panda** of the Himalayas is a beautiful little member of the raccoon family that feeds on fruits, eggs, birds, and insects. Its favorite food, however, is bamboo. The name "Panda" is said to be a contraction of two Nepalese words meaning "bamboo-eater." Several young pandas have been reared here.

The weasel family embraces a group of small to moderate-sized carnivores that, as a rule, have rather short legs, elongated bodies, and feet that are equipped with five well-clawed toes. Musk glands are present in most species. They are especially perfected in the skunks and are used by these animals as a protective weapon. Shearing (carnassial) teeth are specialized and well developed in this family, which includes the weasels, minks, skunks, otters, wolverines and others. The **American Otter,** a denizen of lakes and rivers, is typical of its clan. It has webbed feet, dense fur, and a subcutaneous layer of protective fat. It feeds primarily on fish and crayfish, and is exceedingly playful. The **Kenai Wolverine** of Alaska has a formidable reputation and is said to be able to destroy creatures as large as sheep, caribou, and moose. The wolverine, which is the largest member of the family, may reach a weight of 35 or 40 pounds. It is circumpolar in distribution and never ventures far south except along high-flung mountain ranges. In California it has been recorded as far south as Kern County.

The civets are native to Europe, Asia, and Africa, including Madagascar. One form, the mongoose, has been introduced in Hawaii and the West Indies where it has become well established. The civets are distant relatives of the cats, but are distinguished from them by their long fox-like muzzles, greater number of teeth and unretractable claws. The giant of the family, the **Binturong,** is an inhabitant of the deep forests of tropical Asia and the Indonesian islands. It is a shaggy animal

weighing about 35 pounds. Its heavily-haired tail has a prehensile tip, indicating its arboreal habits. The food of the Binturong is varied, consisting of eggs, fruits, birds and other small animals.

The hyenas are confined to Asia and Africa. They are characterized by having extremely powerful jaws, front legs proportionately longer than the back ones, as well as technical structural peculiarities of the teeth. Hyenas are reputed to be extremely cowardly despite having the most powerful jaws of any mammal. They have given up the active pursuit of prey to become scavengers and carrion eaters, following the lion and other big carnivores to clean up their leavings. The **Spotted Hyena** also is known as the "laughing hyena" because of its weird calls. This animal is the largest of the hyenas and is confined to Africa south of the Sahara. The smaller **Striped Hyena** inhabits the desert regions of North Africa and southwestern Asia. This mammal is distinguished from its spotted cousin by smaller size, ears that are narrower and more pointed, and the presence of a mane of erectile hair along the back.

The cat family contains some of the most impressive members of the mammal group. Among the characteristics that distinguish its members are a short, rounded skull, padded feet and, in most species, retractable claws. The feet are digitigrade rather than plantigrade; that is, the cat walks on its toes rather than on the soles of the feet. Cats occur in the wild state in North and South America, Europe, Asia and Africa.

**SPOTTED HYENA — Africa**

**STRIPED HYENA — Asia and North Africa**

The lion of Africa and southwestern Asia may attain a weight of 450 pounds. It can reach a running speed of fifty miles an hour for short distances and, despite its heavy build, has been known to clear seven-foot fences. Although called "king of the jungle," the lion is a denizen of veldt and scrub, not forest. It still is fairly common in Africa but has become rare in the Asiatic parts of its range. Finest of the lions exhibited here is the **Masai Lion** from Kenya, British East Africa.

The tiger has a wide distribution in Asia, ranging from Siberian wastelands to the tropical forests of Malaya, Java and Sumatra. There are reports of 650-pound tigers, but ones weighing between 400 and 500 pounds are more typical. Like most other cats, tigers are nocturnal. They prey on deer, swine and stock animals. Although man-eaters do occur, they are almost invariably aged or maimed animals that no longer can run down more preferable prey. Tigers love water and are seldom found far from lakes or streams. The **Bengal Tiger** of India and the smaller **Sumatran Tiger** are exhibited here.

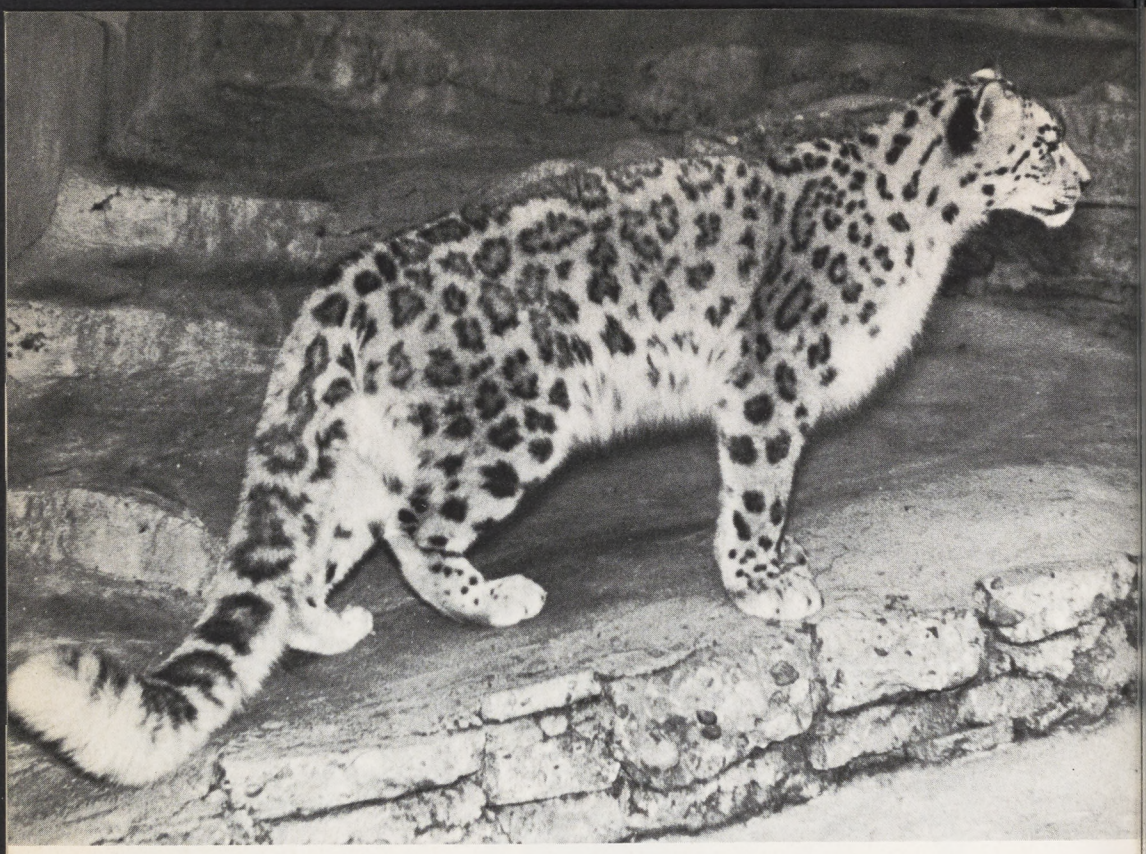
The **Leopard** has the widest range of any wild species of cat. It inhabits much of Asia and most of Africa. The black leopard is merely a color phase of the spotted form. Both black and spotted cubs occur in the same litter. Leopards exceeding eight feet in length occur but are rare. A seven-foot leopard will average about 115 pounds. These cats are more arboreal than the lion or tiger and will cache carcasses high in trees for future meals.

Of all the big cats, the **Snow Leopard** is perhaps the most sought after as a zoo exhibit, both because of its rarity and because of its beauty. Its soft, thick pelage is gray and white, handsomely marked with irregular black rings. The species inhabits mountainous country between 7,000 and 18,000 feet in central Asia where it preys on wild sheep, goats and smaller game.

The **Jaguar** is the largest of all New World cats. It resembles the leopard but is stockier in build and has spots, called rosettes, in the form of irregular rings with dots in the center. The spots of the leopard are more compact. The Jaguar may weigh as much as 300 pounds. It occurs from Arizona south throughout the American tropics.

The cats that lack the roaring mechanism in their throat structure are classified in a different scientific group. Largest of these is a species known variously as **Mountain Lion, Puma, Catamount, Panther, Painter** and **Cougar.** It is found from Canada to southern South America and still occurs in the wild state in California. Many small cats inhabit the West-

**TIGER — Asia**



**SNOW LEOPARD — central Asia**

ern Hemisphere, but none exceeds the familiar **Ocelot** in beauty. This spotted feline occurs from southwestern United States south into South America. The **Canadian Lynx** occurs from northern United States to Alaska. In the Old World its place is taken by the **European Lynx.**

There are many small forms of cat native to the Old World. The **Jungle Cat** inhabits southern Asia and northeastern Africa. The **Leopard Cat** and the **Golden Cat** occur in southeastern Asia, while the long-necked, stilt-legged **Serval** lives only in Africa. The **Cheetah, Chita,** or **Hunting Leopard** is found in Africa and India. Unlike other cats this animal does not have fully retractile claws; that is, the claws cannot be sheathed. The cheetah is the fastest of all mammals. In India it has been trained to hunt Blackbuck and Chinkara Antelopes. Today it is so rare in Asia that animals for taming are now imported from Africa.

The marine branch of the carnivores is divided into three groups: walruses, sealions, also called eared seals, and true seals. Walruses have tusks, sealions have conspicuous external ear-flaps, and true seals have neither. Walruses are characterized by their large size, thick bodies, coarse bristling whiskers, and well developed tusks. They inhabit northern seas and ice floes. Both the **Pacific Walrus** and **Atlantic Walrus** have been exhibited here. An adult male of either may reach a length of eleven feet and a weight of over 3,000 pounds. Females are much smaller.

Eared seals are distinguished by their external ear-flaps and by their ability to use the hind flippers as feet when on land. The **California Sealion,** which inhabits the coasts of Southern California and Baja California, is the form usually seen in trained seal acts. This species is to be seen in large rookeries on off-shore islands, and playing around the rocks along the mainland. Adult males (bulls) reach a length

of seven feet. A large male at the Zoo weighed 515 pounds and was over 20 years old. Females (cows) average about 150 pounds. Babies are called pups. The **Steller Sealion,** which occurs from Southern California islands north to the Bering Sea, is a much larger animal. An adult bull may exceed 2,000 pounds and a length of ten feet, while a cow may reach 600 pounds and seven and a half feet.

Fur seals belong to the eared seal group. The **Northern Fur Seal,** the kind that breeds on the Pribilof Islands, is a migratory species. In winter the females roam the Pacific south to San Diego. Once nearly extinct, the fur seal now is carefully protected. Its guardian, the U. S. Fish and Wildlife Service, has in the past placed specimens in the Zoo for study purposes. One specimen shown here was the first of its kind to be born in captivity. **Northern Fur Seal** bulls are blackish above with plushy buff-brown under-fur. Cows and pups tend to be more gray. Fur seals are polygamous. A single bull may accumulate a harem of eighty cows, which he must be able to defend against all contenders. Male seals not yet old enough or strong enough to defend harems are known as bachelors. Adult bulls may reach a weight of 600 pounds. Cows are much smaller and average about 125 pounds.

Members of the earless seal group have hind flippers incapable of forward rotation. The **Harbor Seal,** common in the bays and estuaries of the California coast, often are seen in Mission and San Diego Bays. This thick-bodied spotted seal cannot use its hind flippers for walking on land; it merely drags them behind. In swimming, these flippers serve as rudders. A large **Harbor Seal** weighs about 250 pounds. This form occurs from Alaska to Baja California, and closely related races inhabit the waters off the Atlantic states and Europe. The **Hawaiian Monk Seal** inhabits the northern islands of the

**NORTHERN FUR SEAL — Pribilof Islands**

**NORTHERN ELEPHANT SEAL—coasts of California and Baja California**

Hawaiian group. Rare in the wild due to commercial sealing during the 19th century, the species was first shown in the United States at the San Diego Zoo.

Largest of all seals are two species of elephant seal. The **Northern Elephant Seal** is found off the coast of southern California and Baja California. This seal was at one time on the verge of extinction; but due to protective measures taken by the game departments of the United States and Mexico, it is re-establishing itself. The San Diego Zoological Society played an important role in the battle to gain protection for this interesting animal, chosen to adorn the official Zoo Seal. Bull elephant seals may reach a length of over 16 feet and weigh 5,000 pounds. They develop long flexible probosces that resemble short elephant trunks.

## **Elephants:** *Proboscidea*

The elephants are the only living representatives of the order Proboscidea. They are the largest of all land mammals and are represented by two species, one in southern Asia and one in Africa. Formerly, however, they were widespread and occurred not only in Europe but also in North America. Fossil remains have been recovered from southern California deposits. Despite tales to the contrary, the average longevity of elephants is less than that of man. Much longer in proportion is the gestation period which varies from 18 to 22 months. The **African Bush Elephant** is represented in the collection by examples of two races, the typical South African and the quite similar East African. Other forms inhabit western and northeastern parts of the continent. The African elephant may attain a weight exceeding five tons and a shoulder height of eleven

feet. A single tusk from a bull weighed 236 pounds. The African elephant is characterized by its large ears and by the presence of two finger-like processes at the end of the trunk. Cows as well as bulls usually have tusks.

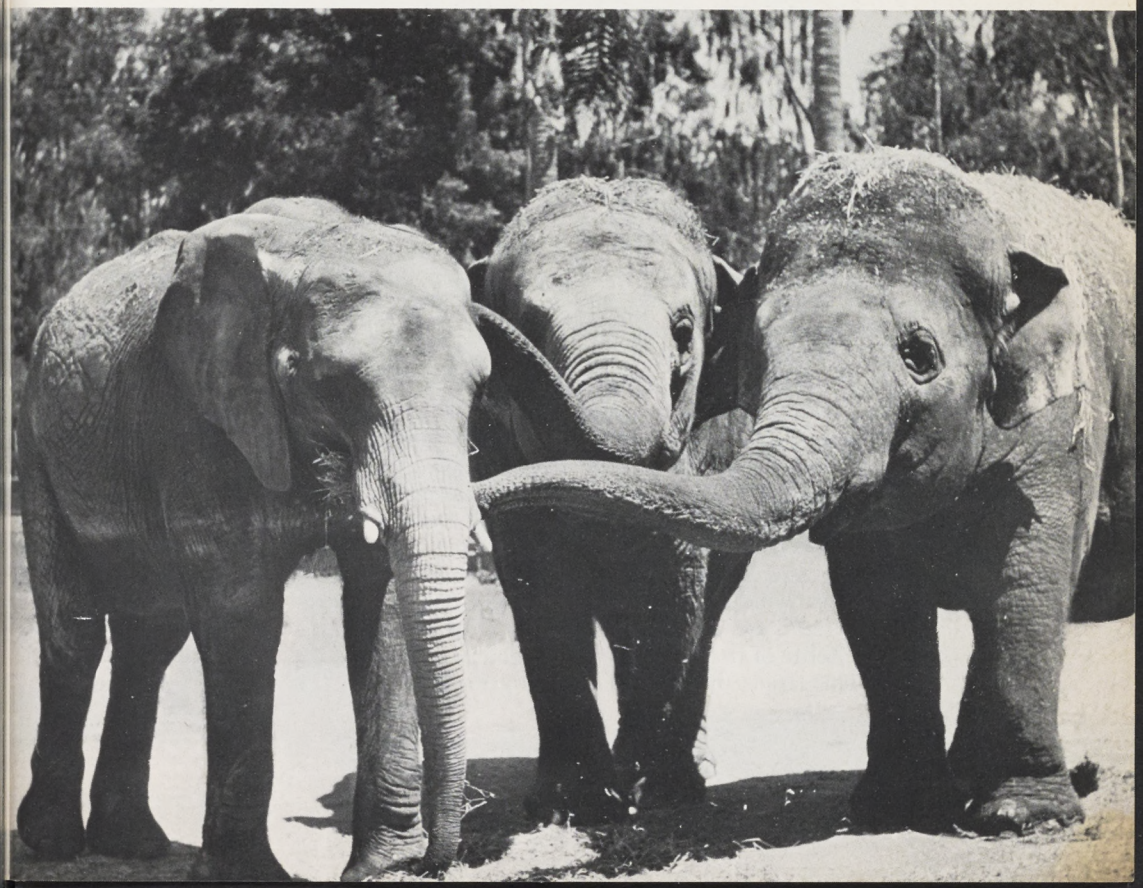
The **Indian Elephant** is native to southeastern Asia, Sumatra and Borneo. This is the species usually seen in circuses and zoos. This species is smaller and less lanky than its African relative, seldom reaching a weight of four tons. At birth it weighs around 200 pounds. This elephant has smaller ears than the African variety, only one finger-like projection at the tip of the trunk, and usually only the bulls develop visible tusks. It is used as a riding and work animal.

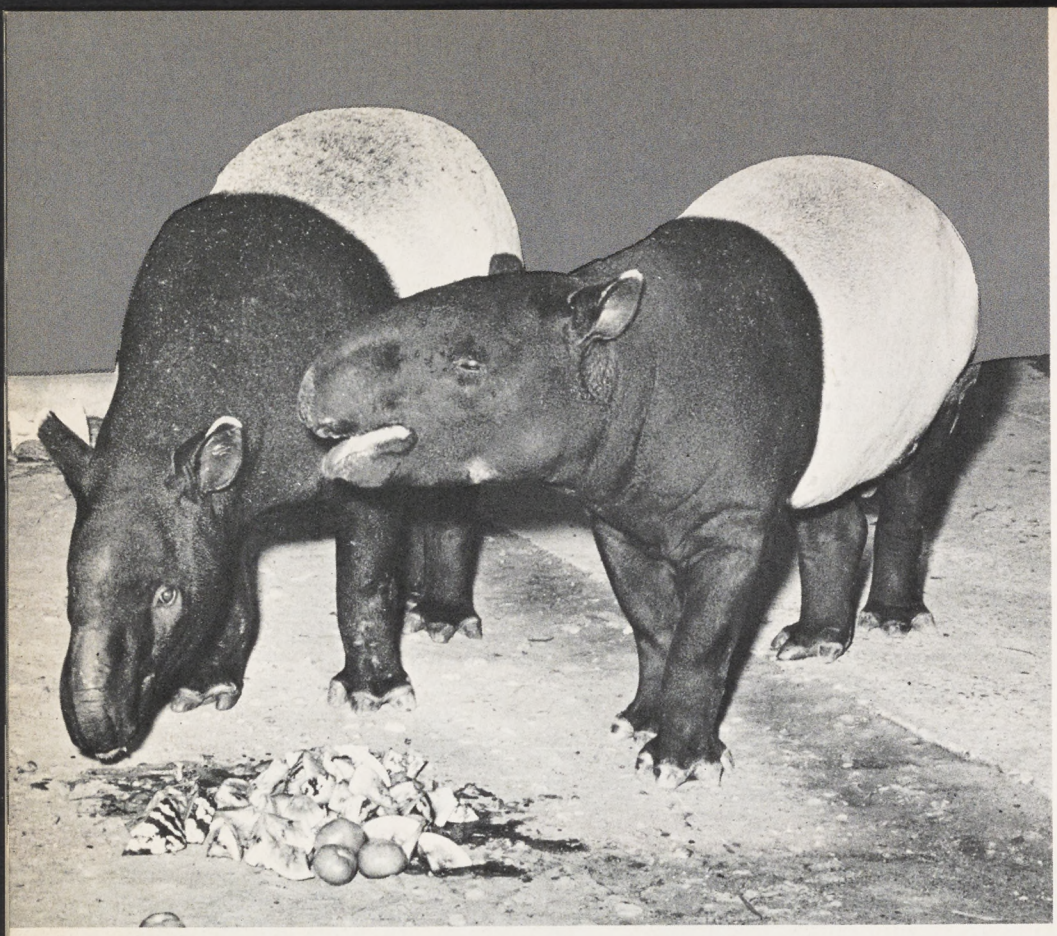
## Hyraces: *Hyracoidea*

Strange as it seems, the little, superficially rodent-like hyraces appear to bear a closer relationship to elephants than any other living creature. Native to Africa and Asia Minor, these are the creatures referred to as coneys in the Scriptures. Their hoof-like nails and a pair of tusk-like teeth indicate their relationship to the pachyderms. The species usually exhibited here is the Rock Hyrax.

**ROCK HYRAX — Africa**

**AFRICAN BUSH ELEPHANT (left), INDIAN ELEPHANTS (right)**





MALAYAN TAPIR

## Odd-toed Ungulates:
### *Perissodactyla*

Most hoofed mammals are placed in one of two categories: those with an odd number of toes and those with an even number. All cloven-hoofed mammals belong to the second group. Odd-toed mammals include the horses, tapirs, and rhinoceroses.

The most commonly-exhibited members of the horse family are the zebras from the plains of eastern and southern Africa. Zebra markings often are compared with human finger prints in that no two animals are striped exactly alike. These animals are extremely nervous and can be savage and dangerous in captivity. Largest of the group is **Grevy's Zebra** of northern Kenya and Abyssinia. This large-eared, mule-like creature is characterized by extremely narrow stripes. It inhabits semi-arid scrubby areas. It was named after Jules Grevy, president of France at the time the animal was first described. The **Burchell's Zebras** are distributed from northern Kenya south into South Africa. They are chunkier, smaller animals than the Grevy's and their stripes are much broader. A number of races of this species are recognized. **Chapman's Zebra** of south central Africa and **Grant's Zebra** of the highlands of East Africa usually are exhibited here. The first has tan interspaces between stripes and brown shadow stripes on the flanks.

Of the many types of tapirs that existed in prehistoric times, only four have survived; one in southeastern Asia and three in tropical America. These are long-snouted, heavy-bodied mammals, semi-aquatic in habitat. A large part of the diet

is composed of aquatic vegetation. The **South American Tapir** of tropical South America stands about three feet high and has a sparse coat of coarse brown hair and a short, bristly mane. The **Malayan Tapir** also is known as the **Saddle-backed Tapir** because of a large, sharply defined area of gray on its back and sides. Elsewhere the body is black. This tapir stands about 40 inches at the shoulders and weighs about 520 pounds. It inhabits swampy forests from Malaya north to Tenasserim and occurs in Sumatra as well.

The rhinoceroses are confined to the Old World. Three species occur in southern Asia and adjacent islands. Two are native to Africa. All are characterized by large size, nearly naked skin and by the presence of horn-like structures on the muzzle that are composed of agglutinated hair. Next to the elephants, the rare **White Rhinoceros** is the largest of all land mammals. An adult male may attain a shoulder height of six feet, six inches. A record horn length for the species is 62½ inches. Although the White Rhino was once widely distributed in Africa, it now is restricted to one small area in Zululand, Natal, and another in central Africa. The White Rhino is far more placid than other kinds of rhinoceros, thus more easily hunted, with the result that it was nearly exterminated before effective protective measures were imposed. Our specimens were obtained from Umfolozi, South Africa. The **Black** or **Hook-lipped Rhinoceros,** now becoming rare but once common throughout Africa south of the Sahara, is characterized by a prehensile, pointed upper lip and by the presence normally of two horns, the front one usually being the longer. Rhinos feed entirely on vegetation. Despite their formidable reputation, they are not vicious. Their hysterical charges generally are attributed to panic resulting from very poor eyesight.

**BLACK RHINOCEROS — Africa**

**COLLARED PECCARY — North, Central and South America**

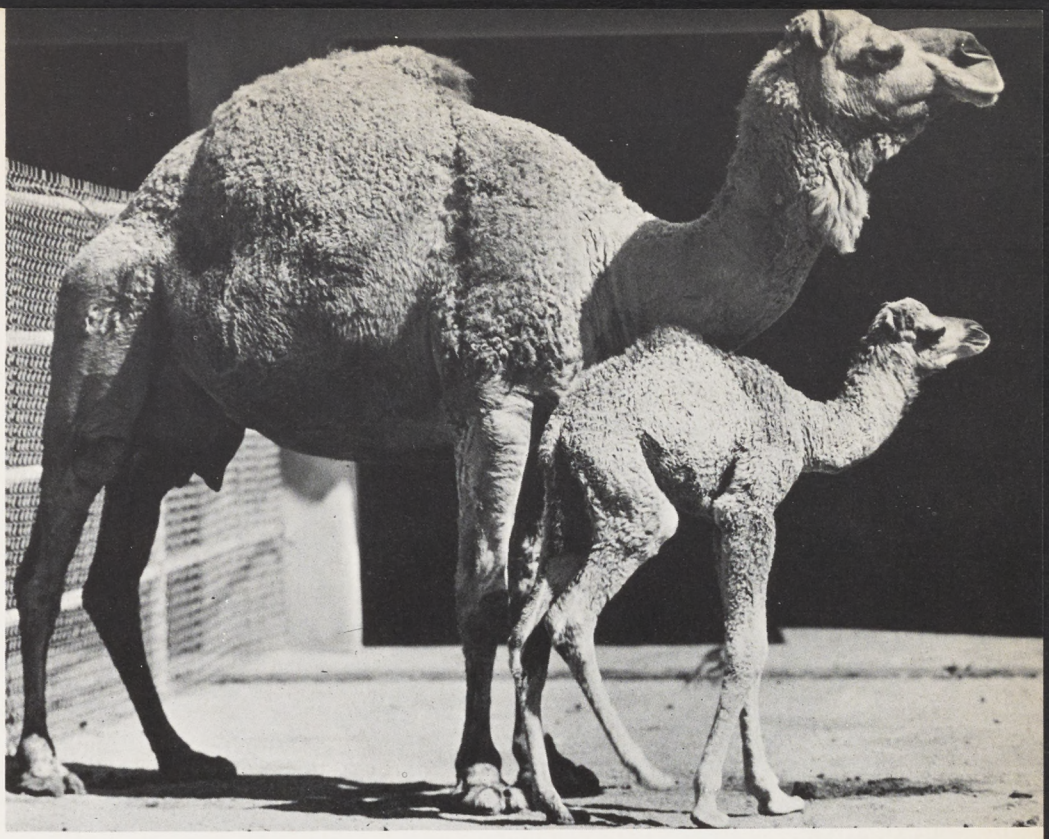
## Even-toed Ungulates:
### *Artiodactyla*

This order of cloven-hoofed mammals contains many families. Included are cattle, goats, sheep, swine, camels, deer, giraffes, antelope and others.

The true swine are native to the Old World, but domestic varieties have been introduced into all parts of the world. The New World counterparts of the swine are known as peccaries. They are distinguished from their Old World relatives by small size, the presence of three instead of four toes on each hind foot, a well-developed musk gland on the back, and short straight tusks. The **Collared Peccary** or **Javelina** ranges from the South American pampas north to Arizona. It weighs forty to fifty pounds when adult, roams in packs and can be dangerous when provoked.

Although the hippopotamuses resemble big pigs, they belong to a family all their own. The family, containing two species, is confined to Africa. The **Hippopotamus** is native to most of Africa's major rivers. Due to man's encroachment, it has disappeared from many of its former haunts, but is still abundant in some areas. This semi-aquatic monster lives in groups and is generally inoffensive where man is concerned, though it can be quite savage when persecuted. Weighing only sixty to ninety pounds at birth, it may reach a weight of four or five thousand pounds when adult. A number of hippos have been reared in the Zoo. The other representative of this family is the rare **Pygmy Hippopotamus** of Liberia and Sierra Leone. Weighing

**HIPPOPOTAMUS — Africa**



ARABIAN CAMEL

400-600 pounds, this species is far less aquatic than its large relative and prefers to roam alone or in pairs.

The camel family is represented in Africa, Asia and South America. Of the six types, three, possibly only two, are found in the wild state. The **Arabian Camel** is the single-humped variety that is used as a steed and pack animal in the hot deserts of Africa and Arabia. Domesticated for several thousand years, this species does not occur in the wild state. Despite its reputed ability to go without water for long periods, it must drink at least once every three days to remain healthy. The hump is composed of fatty tissue that, in times of drought or famine, breaks down to provide nourishment and metabolic water. Water, as such, is not stored here. The **Bactrian Camel** has two humps. It is used as a pack animal in the high cold deserts of central Asia. This species is believed to exist in the wild state in Chinese Turkestan and Mongolia.

In the New World the camel family is represented by four humpless forms, two of which are domesticated animals that probably were developed from the wild **Guanaco** of western South America, from Peru to Tierra del Fuego. This slender creature thrives up to 15,000 feet in the Andes. Its domesticated descendents are the **Llama,** which is used as a pack animal, and the **Alpaca,** which is bred for its wool. The delicate **Vicunia** stands only 33 inches high at the shoulders and is the smallest member of the family. It is native to Peru, Bolivia and southern Ecuador. Its silky fleece is in great demand and brings fabulous prices in world markets.

The members of the deer family may be distinguished by the presence of antlers in the males and lack of a gall bladder. In addition, most species possess upper canine teeth which are quite well developed in the forms that do not possess antlers. Ant-

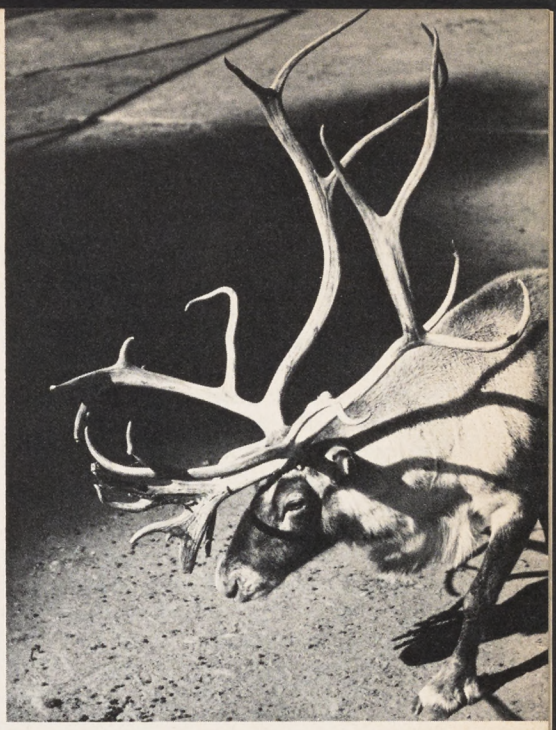
AXIS DEER — India and Ceylon

lers are branched structures of true bone that usually are shed annually. During growth they are soft and sensitive and are covered with hairy skin known as velvet. When the antler reaches full size, the blood supply is cut off, and the deer scrapes the velvet off against tree trunks and branches. With the exception of the caribou clan, in which both sexes are antlered, only bucks develop these structures. Deer are native to Asia, Europe, North and South America, and North Africa.

The wapiti of western United States and Canada is the second largest of the deer family. Large bucks sometimes weigh as much as 1,000 pounds. The **Rocky Mountain Wapiti** is the form usually displayed here. The enormous antlers of the buck usually are dropped in March, and a new set is grown in about four-and-a-half months. An average set of antlers dropped by an elk at the Zoo weighed 27 pounds. The longest was four feet, three inches long. During the breeding season bull wapiti can be quite savage and dangerous.

Several forms of Asiatic deer are exhibited here. The **Sika Deer** and related forms inhabit the Japanese Islands, China and Manchuria. In summer these deer are covered with pale spots which become less evident as winter approaches. The **Axis Deer,** or **Chital,** is native to India and Ceylon. It is profusely spotted at all seasons and throughout the life of the animal. The **Fallow Deer** of the Mediterranean countries of Europe and Asia Minor have flattened palmate antlers. Normally brown with white spots, this deer also has white and dark color phases. The tiny muntjac deer, some races of which are only 16 to 19 inches high, are widespread throughout eastern and southeastern Asia. For defense they have long canine teeth, the short antlers being not too useful. Muntjacs also are known as "barking deer" because of their cries. The **Yellow Muntjac** of China is exhibited in our Zoo.

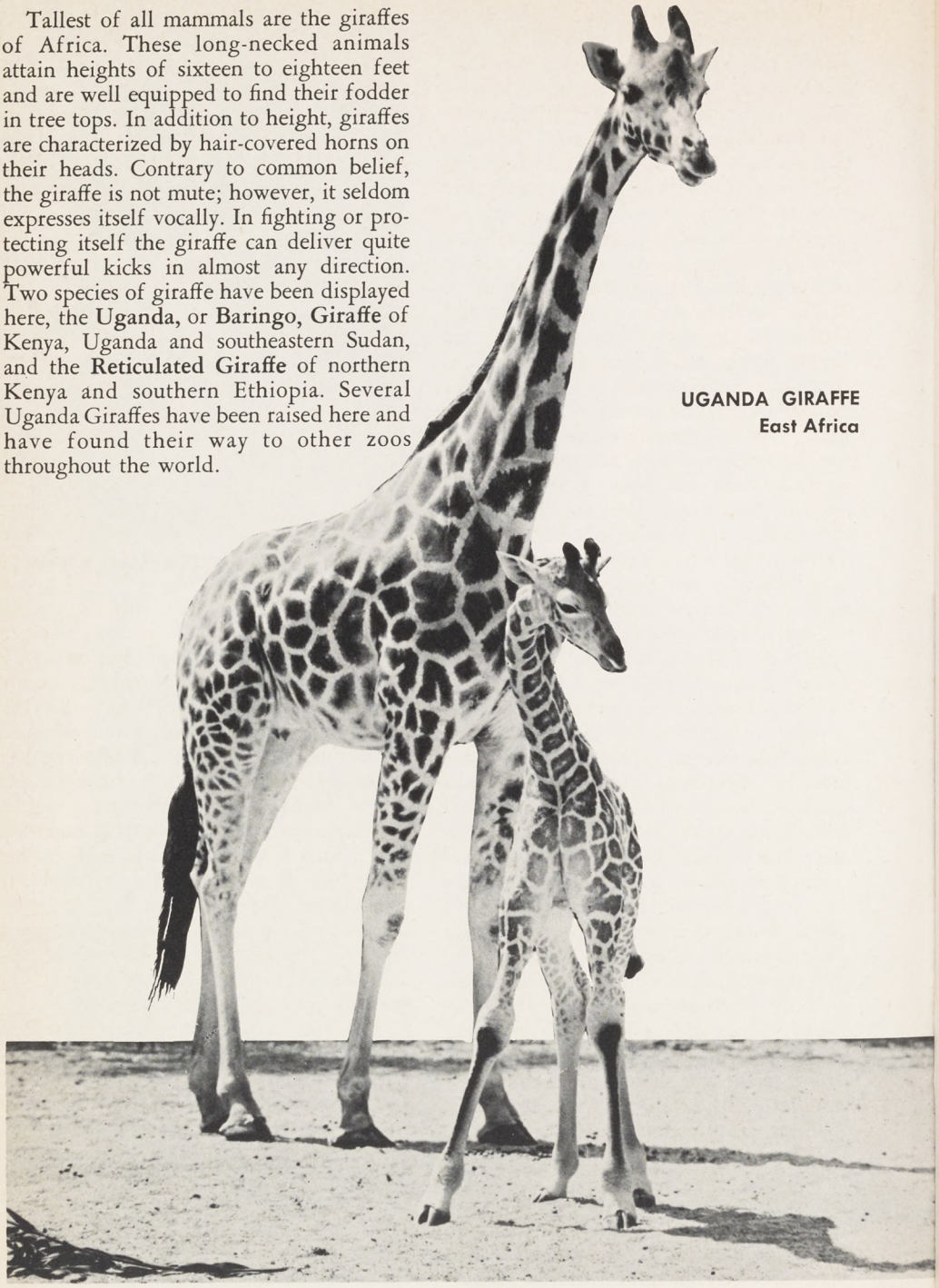
Most familiar of all American deer are those belonging to the *Odocoileus* group. The **Mule Deer** occurs in western United States and gets its name from its proportionately large ears. It is distinguished from the **White-tailed Deer,** which occurs in great numbers in the eastern part of the country, by the ear size, more subdued color of the tail, and manner of branching of antlers. The **Moose** is the largest member of the deer family. It occurs in northern Europe, Asia and North America. Large bulls of this species may well exceed 1,400 pounds in weight. It is characterized by its size, immense spreading, flattened antlers and a pendulous dewlap hanging from the throat. It prefers low wet places, inhabiting spruce forests, swamps, and thickets bordering lakes and rivers.



**EURASIAN REINDEER**

The reindeer-caribou group is limited to the barren flatlands and bleak mountains of the far north in both hemispheres. Gregarious and migratory, they are sometimes to be seen in enormous herds as they move from one area to another in search of the stunted vegetation upon which they feed. Both sexes bear antlers, unlike all other deer where only the males normally are so adorned. The **Eurasian Reindeer** is the living prototype of Santa's steeds.

Tallest of all mammals are the giraffes of Africa. These long-necked animals attain heights of sixteen to eighteen feet and are well equipped to find their fodder in tree tops. In addition to height, giraffes are characterized by hair-covered horns on their heads. Contrary to common belief, the giraffe is not mute; however, it seldom expresses itself vocally. In fighting or protecting itself the giraffe can deliver quite powerful kicks in almost any direction. Two species of giraffe have been displayed here, the **Uganda,** or **Baringo, Giraffe** of Kenya, Uganda and southeastern Sudan, and the **Reticulated Giraffe** of northern Kenya and southern Ethiopia. Several Uganda Giraffes have been raised here and have found their way to other zoos throughout the world.



**UGANDA GIRAFFE**
**East Africa**

Secretive, almost legendary dweller of the rain forests of the Congo Republic, the **Okapi** remained unknown to science until the turn of the century. This is not surprising considering the habits and restricted range of this unique relative of the giraffe. It haunts the most inaccessible areas of its habitat—regions of perpetual gloom. And for centuries it was known only to the pygmies. Capture of these wary animals is effected by means of concealed pitfalls some six feet deep, by six feet long, by three feet wide. The bottom is bedded with leaves to prevent injury. After an animal has been captured it is maneuvered into a stockade and from there into a foliage-camouflaged crate on a truck. Under strict protection in the wild, specimens are captured for study and exhibit purposes only. "Bayahu," the San Diego Zoo's male Okapi, was obtained in November, 1956; and subsequently two females were acquired, all from the Belgian government. Since that time the species has borne and reared young here, an exceedingly fortunate occurrence as the Okapi now is almost impossible to procure from the Congo.

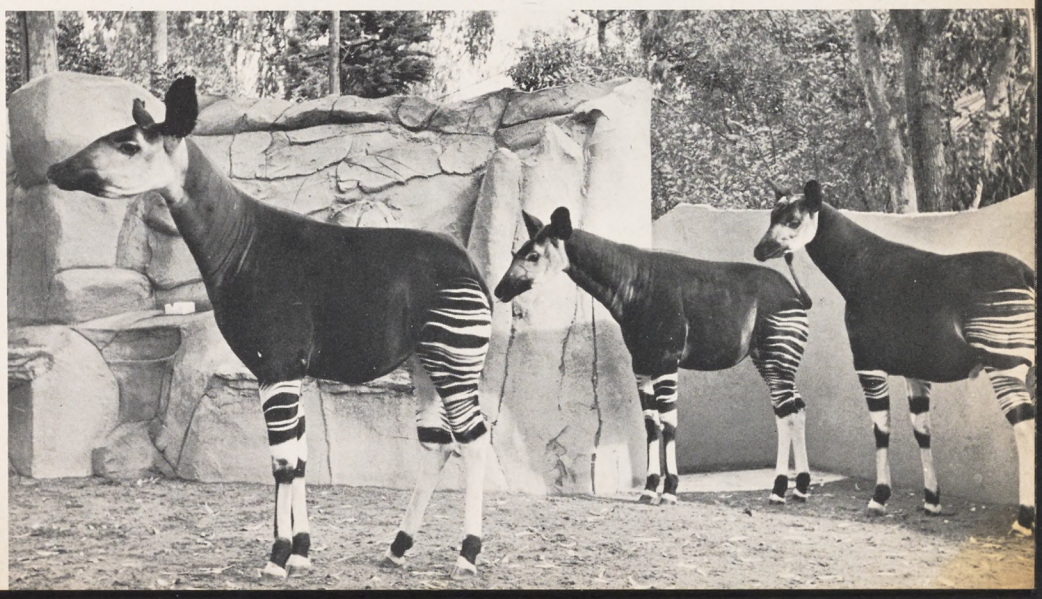
The **American Pronghorn** occurs only in western North America. Although frequently called an antelope, this animal is sufficiently different from all others to rate a family name *(Antilocapridae)* to itself. It is the only horned animal that sheds its horns each year, just as a deer sheds its antlers. These hollow horns are unique in having a branch or prong. They form a sheath to a bony core which is not shed. Pronghorns now are greatly reduced in numbers, though they still may be found in regions where they are afforded adequate protection. One of the fastest of the hoofed mammals, the pronghorn has been clocked at over 60 miles per hour.

The family *Bovidae* embraces all of the horned mammals except the pronghorns. Included here are the cattle, sheep, goats, antelopes and so-called goat-antelopes. Members of this family retain the horns throughout life instead of shedding them periodically as deer shed their antlers.

Among the most picturesque of these mammals is the **American Bison** which roamed the western plains in incredibly great numbers a few years ago. Within a short time, during the 1870s and '80s, their millions were reduced to a few scattered herds. Fortunately, legal protection for the species was brought about, and it survives on various reserves in the United States and Canada. The **Yak,** native to Tibet, Ladak and Kansu, serves as a pack animal at high altitudes in central Asia.

The **African Buffalo,** which inhabits Africa south of the Sahara, is considered to be one of the most dangerous of all game animals. Its broad, thick horns meet at their bases to form an almost bullet-proof helmet. The **African Buffalo,** unlike its Asiatic cousin, the **Water Buffalo,** has

**OKAPI — Congo Republic**



**ASIATIC IBEX — central Asia**

never been domesticated. Smallest of all cattle is the **Anoa** of Celebes. This rare little ox stands about three feet high and, despite its size, can be extremely dangerous.

Various species of wild sheep occur in North America, Europe, and Asia. One species, the **Aoudad,** inhabits the arid ranges of North Africa. Unlike typical members of this group, the Aoudad has long fringes of hair on the chest and forelegs. Also unusual is the fact that the horns of the ewes are nearly as large as those of the rams. The **Bighorn** inhabits many of the large ranges of western North America. Both sexes bear horns, but those of the male are much larger. This sheep is one of the wariest of all American big game and usually occurs far from the haunts of man. The **Mouflon** of Corsica and Sardinia is a smaller species that now is scarce in the wild.

Separation of goats and sheep is a rather difficult task since there are intermediate forms that share characteristics of both. In general, it may be said that males of all goats are characterized by a strong musky odor, males of most species have chin beards, and none of the species of goats have glands between the hooves of the hind feet as is characteristic of sheep. The species of wild goat most frequently seen in zoos is the shaggy **Himalayan Tahr,** which occurs above the timberline in the mountains of northern India. An adult male may stand 38 inches high at the shoulders and weigh 200 pounds. Due to their wary natures and the rugged terrain they inhabit, they are coveted as trophies by sportsmen. The magnificent **Asiatic Ibex,** a more typical representative of the goat clan, is widely distributed throughout the mountains of central Asia from the Tien Shan and the Altai to the Himalaya in Kashmir. The male's bearded clown-like face sets off his huge transversely knobbed sweeping horns. A record pair of horns for this ibex is 54 inches along the curve, with a girth of 11½ inches above the first knob.

The term "antelope" has little meaning, for it is applied to a horde of diverse creatures. Some are no larger than rabbits, others are the size of oxen. The **Nilgai** is native of India's plains from the Himalayas to south of Mysore. Males are blue-gray, hence the name "blue bull." Males stand 55 inches at the shoulders and have short spike horns. Females are brown and do not bear horns.

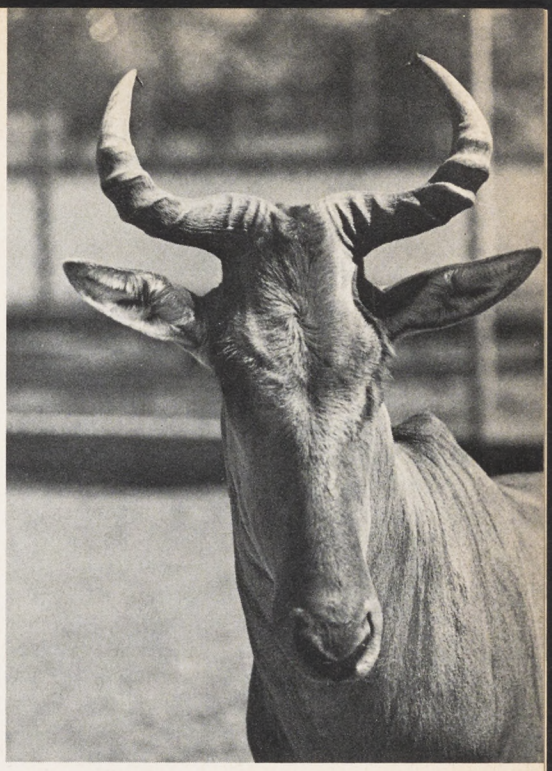
Africa is inhabited by a host of antelopes allied to the Nilgai. Most species are marked with white stripes that have caused the group to become known as "harnessed antelopes." The **Bushbuck** sports a striking array of bands and blotches and, in the male, a pair of short, twisted, lyre-shaped horns. The male **Lesser Kudu** has a handsome set of corkscrew horns and, as does the female, a series of vertical white body stripes. The **Sitatunga** is a coarse-coated inhabitant of the papyrus swamps of central Africa. Largest of the group (and of all antelopes) is the **Eland,** in which both sexes are horned. An Eland bull may weigh 1,500 pounds.

The wildebeest-hartebeest group is represented in most parts of Africa, where

some of its members exist in herds of thousands. The **White-bearded Gnu** is still abundant in parts of East Africa, while the **White-tailed Gnu** of South Africa's high veldt now is extinct outside of zoos and game refuges. The speedy, hump-shouldered **Coke's Hartebeest,** or **Kongoni,** occurs in large numbers on East African plains. Its horns appear bracket-shaped from the front and Z-shaped from the side. The **Blesbok** is another once-common South African species now found only in a state of semi-domestication.

The **East African Sable Antelope** inhabits Tanganyika and coastal Kenya. Because of the trophy value of its spectacular 3½-foot, scimitar-like horns, it has become rare throughout much of its range and in zoos as well. Many young have been reared here. The **Fringe-eared Oryx** of East Africa is a related species with long, straight lance-like horns. Its black, gray and white markings are striking.

The tiny **Abyssinian Klipspringer** stands less than two feet high and is distinguished by coarse, pithy hair and elongated hoofs. Klipspringers are noted jumpers and are found in rocky, moun-



**COKE'S HARTEBEEST — East Africa**

**EAST AFRICAN SABLE ANTELOPE**

tainous terrain throughout Africa. Another group of generally-small African ungulates is comprised by the Duikers—a Boer word meaning "divers," which describes their plunging manner of running when alarmed. Largely herbivorous, they also are known to eat snails, insects and bits of carrion. **East African Crowned,** or **Grey, Duikers** and **Angolan Black-backed Duikers** have been shown here.

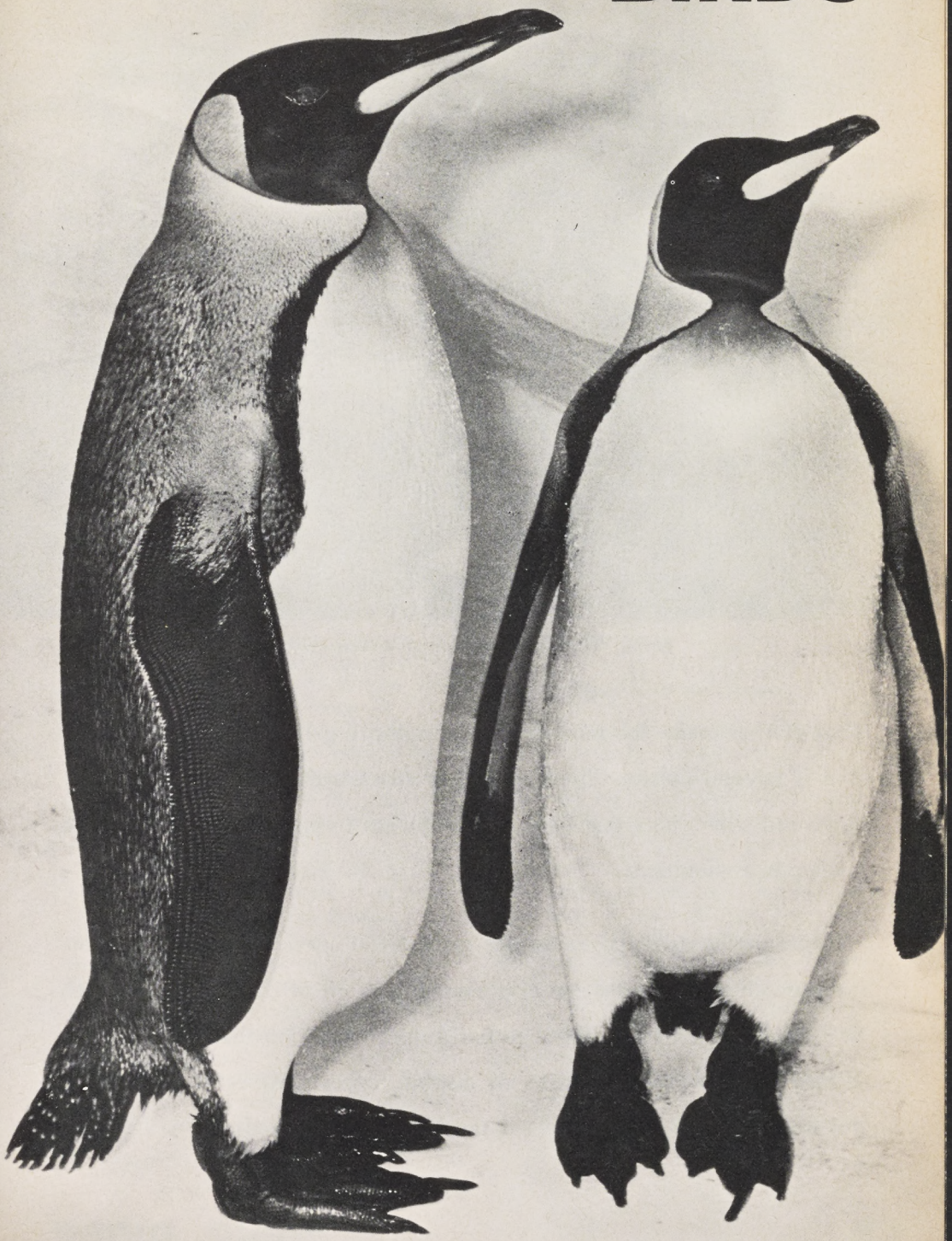
The gazelles and their relatives of Africa and Asia are known for pencil-like legs, slender bodies, and graceful movements. One of the largest is the statuesque **Grant's Gazelle.** Also an inhabitant of East African bush and plain is the smaller, stockier **Thomson's Gazelle.** The closely related South African **Springbok** has a strip of erectile white hair down the center of the back and on the rump. This hair patch flashes like a semaphore when the animal is alarmed. The **Blackbuck Antelope** of India's plains-country is notable for the corkscrew horns of the male. The adult males are quite dark colored throughout much of the year; females are more sandy. In India Cheetahs are trained to run down the speedy Blackbuck.

Among the choicest antelope in collections is the giraffe-necked, spindle-legged **Gerenuk** from East Africa and Ethiopia. An inhabitant of the arid thorn and acacia-studded plains, this browsing animal often stands on its hind legs to crop the tops of the trees. Only the males of this species have horns. Likewise, only the male **Impala** bears horns, in this case broadly lyrate and sometimes twenty inches long. This native of East and South African bush is noted for its leaping ability, making jumps ten feet high and thirty feet long.

Allied to the gazelle group is the strange buff-colored **Saiga,** peculiar to the steppes of Russia, Siberia and Mongolia. While the male bears ringed, gazelle-like horns, the female is hornless. Both sexes possess the characteristic bulging snout.

**KLIPSPRINGER — Africa**

# BIRDS



KING PENGUIN — sub-antarctic islands

**FAIRY PENGUIN — Australia and New Zealand**

That clothes make the man is a moot point, but that feathers make the bird is beyond debate. There are other animals that fly, others that lay eggs, and still others that have beaks. But no living creatures other than birds possess feathers.

Authorities currently recognize some 8,600 species of birds. No zoo, no museum in the world contains examples of all of them. The best such an institution can strive for is to build up a collection that offers a cross section of the world's birdlife, to display representatives of as many as possible of the 27 orders and 171 families of living birds.

## **Penguins:** *Sphenisciformes*

No other family of birds has more completely captured public fancy than that of the penguins, yet it is a group about which many misconceptions have arisen. Although penguins have become virtual symbols of Antarctica, only two of the existing eighteen species inhabit that frigid region. Several species of penguins occur on sub-Antarctic islands, others inhabit temperate zone coasts of Southern Hemispheric continents, while one form lives on the equator and slightly north of it.

Penguins, as true birds, are clothed in feathers, not fur as is sometimes asserted. These feathers are small and scale-like, shedding water easily. Other features equip the penguin well for its largely aquatic life: the feet are webbed, the body is streamlined and seal-like, and the wings are flattened, paddle-formed and incapable of flight. Fish, squid, and shrimp, all captured underwater, compose the penguin's principal diet.

The **Emperor Penguin,** largest of living species, stands four feet tall and is truly an Antarctic form. Only occasionally do strays reach temperate shores. Next in size is the **King Penguin,** three feet tall and handsomely colored. Nesting on sub-Antarctic islands, King Penguins sometimes wander north to shores of New Zealand or southern South America.

The crested penguins comprise an easily distinguished group of sub-Antarctic birds: The **Macaroni Penguin** and the **Rockhopper** both possess the characteristic plumes of golden-yellow feathers on each side of the head.

The short-tailed penguins occur farther north than any other members of their clan. The **Black-footed,** or **Jackass, Penguin** inhabits South African islands and coasts, wandering as far north as Angola and Durban. The **Humboldt Penguin** occurs along the west coast of South America as far north as northern Peru, while the **Galapagos Penguin** lives astride the equator on the archipelago whose name it bears.

The **Blue,** or **Fairy, Penguin** of Australia and New Zealand vies with a closely related species for the title of smallest and most primitive of all penguins. In a standing position, it is less than a foot high.

## **Ostrich:** *Struthioniformes*

The **Ostrich** is the largest of living birds. Although it now is found only in the grasslands and bush of Africa, it occurred in recent times on the Arabian Peninsula. Adult males stand seven to eight feet high and may weigh as much as 300 pounds. Males are black with white wing and tail plumes; hens are brownish-gray. Ostriches, which are flightless, have large powerful legs that enable them to run as fast as 40 miles an hour and serve as well in a defensive capacity. Through an evolutionary process, the number of toes on each foot has been reduced to two. The voice of the Ostrich ranges from a loud hiss to a booming roar. An Ostrich nest is a shallow depression in the sand in which ten to twelve eggs are deposited. Both sexes incubate, and the incubation period is 42 days. The buffy-white eggs are six to eight inches long and weigh up to three pounds. Ostriches, which do well in captivity, may live as long as 30 years.

## **Rheas:** *Rheiformes*

Rheas are the South American counterparts of the Ostrich, though considerably smaller. Even so, the **Common Rhea** of Brazil, Argentina and Uruguay is the largest New World bird. It stands between four and five feet tall and weighs up to 50 pounds. Like the Ostrich, it inhabits open country, is flightless, travels in small flocks and has powerful legs. Each foot, however, has three toes instead of two. Both sexes are brown, the male having blackish areas on the head, breast and back. A white variety has been developed in captivity. Rheas are polygamous. Several hens lay their eggs in a communal nest on the ground until it contains between 20 and 30 light yellow eggs, then the cockbird takes over. He incubates the eggs for approxi-

mately six weeks. When the chicks hatch, he broods them and teaches them to eat. The rhea's diet consists mainly of vegetable matter but also includes insects, mollusks and lizards.

## Cassowaries and Emus: *Casuariiformes*

The cassowary family, which is restricted to northern Australia, New Guinea and adjacent islands, contains three species. All are flightless and inhabit deep jungle. Their plumage is coarse and hair-like and is shiny black in the adult, rusty-brown in the immature. Characteristic of all species is a large casque or bony helmet on the crown which protects the head as its bearer crashes through the forest. The bare skin of the head and neck is brilliantly colored in adults and there may or may not be one or two fleshy throat wattles, depending on the species. The toes have stout claws, the inner toenail on each foot being as long as five inches and serving as a powerful pointed weapon. Female cassowaries exceed the males in size. Cassowaries feed mainly upon fruit, augmented by insects and small mammals. Their eggs are pea-green and about six inches long. There are five to nine in a clutch. The male incubates the eggs for 56 days, broods and rears the chicks. The **Aru Double-wattled Cassowary** has been bred and reared in the Zoo.

The **Emu** of Australia is the only surviving member of its family, and it is disappearing rapidly from many of its former haunts. The second largest of living birds, it stands more than five feet tall and may weigh 120 pounds. Its gray-brown plumage is hair-like with double feathers, two to a shaft. The feathers of the head and neck are black and curly. As is also true of the cassowaries, the Emu is three-toed and has strong legs and feet that can provide speedy locomotion and effective defense. Emu eggs are dark green and avocado-like. Seven to ten make up the usual clutch, and they are incubated by the male for eight weeks. With the Emu, also, the task of infant care falls to father.

## Kiwis: *Apterygiformes*

New Zealand is the homeland of three species of kiwi, the nearest relatives of which were probably the extinct moas of the same region. It has been said that the Disneyesque kiwis are the least bird-like of all birds; certainly they are among the most comical and droll. They seem to be all body, bill and feet. Their short stout legs are spaced far apart, and kiwis run with an awkward, rolling and noisy gait. The eyes are small and rat-like. Kiwis are the only living birds with the nostrils situated near the tip of the bill rather than near the base. The sense of smell is highly developed. With their long tubular bills, they probe the earth for worms and grubs throughout the night. Completely flightless, they retain only remnants of wings and have neither wing nor tail plumes. The body feathers, with no interlocking barbules, give the plumage a hair-like quality. Kiwis nest in burrows, laying only one egg that may weigh a pound, one-fourth of the body weight of the adult. The male incubates for a period of about 75 days.

Symbolic of its homeland and chief motif of the Dominion seal, the kiwi appears on New Zealand coins and stamps and is used as a trademark for textiles, shoe polish, flour and a score of other products. Since all species of kiwi receive complete protection in New Zealand, the **Mantell's Kiwi** in San Diego is one of the Zoo's choicest exhibits. At this writing it is the only live kiwi in the Western Hemisphere.

## Tinamous: *Tinamiformes*

Tinamous, of which there are 45 species, are fowl-sized, primitive ground birds found from southern Mexico through Central and South America to Patagonia. In structure and behavior, they present anomalies that have long baffled ornithologists. Of uncertain ancestry, the rheas may be their nearest surviving relatives.

Tinamous are protectively colored in tawny browns and grays and are often barred, streaked and mottled. The sexes are

OSTRICH — Africa

CASSOWARY — Australasia

RHEA — South America

EMU — Australia

**MANTELL'S KIWI — New Zealand**

similar in form and color, but females usually are larger. Their food is mainly seeds, berries and small fruits; but they also will eat insects and other animal food. They forage entirely on the ground, run rapidly, and crouch for concealment in the presence of danger.

Tinamous are ground nesters and lay from one to ten eggs in a simple nest well concealed in vegetation. The eggs are oval with a polished waxy shell which varies in color from a wine red in one species to yellow, green, blue, and even purple in others. The male bird incubates and the eggs hatch in 17 to 21 days.

The **Crested Tinamou** ranges widely over the pampas and is sometimes called "Argentine Partridge."

## Tube-nosed Birds:
### *Procellariiformes*

The order of tube-nosed birds contains a host of oceanic species ranging from tiny sparrow-sized petrels to the largest of all flying sea birds, the albatrosses, some species of which attain a wingspread of eleven feet. Members of the order are rarely seen in zoos because of their highly-specialized marine feeding habits. However, a better understanding of their needs, including salt requirements, has resulted in the successful maintenance of certain tube-nosed birds in a captive environment.

One of these is the slate-colored **Black-footed Albatross** which nests on islands at the northwestern end of the Hawaiian chain and roams the seas of the North Pacific. Its wingspan is approximately seven feet and its body 28 inches long. It

shares with most other members of its order the following characteristics: long narrow wings, webbed feet, and nostrils that extend onto the stout hooked bill in short tubes. Albatrosses generally come ashore only to nest, spending most of their lives at sea where they feed on fish, squid, and even galley refuse. During the nesting season, albatrosses perform amazing communal displays or "dances."

## Pelicans, Gannets, Cormorants: *Pelecaniformes*

Another large order of aquatic birds is that of the tropic-birds, pelicans, gannets, cormorants, anhingas, and frigate-birds. Although the six families involved differ widely in appearance and habit, they have certain skeletal and morphological features in common, including the fact that all four toes on each foot are joined by a web.

Best known of the order are the pelicans which are represented in both Eastern and Western Hemispheres. Some forms occur only on salt water, others primarily on fresh water, and still others seem equally at home on either. All are large birds, some attaining a wingspan exceeding nine feet. Beneath the bill is a large pouch of skin, useful in scooping up schools of fish.

The **Brown Pelican** is a marine species native to southern United States, Central and South America. This is the resident pelican along southern California coasts. The **American White Pelican,** which breeds in western, temperate North America, occurs in winter as far south as Panama. Characteristic is a horny growth that appears atop the bill during the breeding season and is shed shortly thereafter. The **Dalmatian Pelican** is a crested, pale gray form that comes from southeastern Europe and much of Asia. It is rare in zoological collections.

The boobies and gannets are medium-sized marine birds with heavy, streamlined bodies. They have long, pointed wings, straight sharp beaks, wedge-shaped tails and short stout legs. All members of the family fish by diving on their prey and pursuing it underwater. A network of air sacs under the skin cushions the impact when the birds hit the water. The **Northern Gannet,** about three feet in length, lives along both shores of the North Atlantic. Adults are white with black wing tips and yellowish heads; young birds are brown with white spotting. The **Blue-footed Booby,** a smaller creature, inhabits coasts and islands in the eastern tropical Pacific from Mexico to Peru and the Galapagos. The **Red-footed Booby** has a wider range in the tropical seas of the Atlantic, Pacific and Indian Oceans.

Some 30 species of cormorant inhabit temperate and tropical waters of both Eastern and Western Hemispheres. While some prefer a maritime habitat, others inhabit lakes and streams. All are long-bodied, comparatively long-necked birds, with well-developed throat pouches. Their bills, well-adapted to fishing, are hooked at the tip. The **Japanese Cormorant** is a form that has been trained to catch and retrieve fish for its human masters. A small collar, placed around the bird's neck, prevents swallowing of the fish. Black with bronze and purplish reflections, the Japanese Cormorant grows filimentous plumes on the head and neck during the

**LITTLE PIED CORMORANT—Australia and New Zealand**

**ANHINGA — tropical and semi-tropical America**

nesting season. The **Little Pied Cormorant** of Australia and New Zealand is, as its name would suggest, black and white, while the **Pygmy Cormorant** of eastern Europe, northern Africa and southern Asia is mainly greenish-black.

The darters are closely allied to cormorants and somewhat resemble them. They are long, slim birds with elongate, snake-like necks and sharp bills that render underwater spear-fishing a simple matter. Darters inhabit lakes, rivers and swamps in the tropical regions of North and South America, Asia, Africa and Australia. All species are blackish, with buffy streaks and spots on the back and wings. The **Anhinga** (a term employed by Amazon Indians) ranges from southeastern United States through the tropics of Central and South America. A similar species, the **Indian Darter,** occurs from India to Indonesia and the Philippines.

Frigate, or man-o-war, birds are avian pirates that steal fish from other sea birds in mid-air. They occur over most tropical seas. **Palmerston's Frigate** of the Central Pacific has been shown here.

## Storks, Ibises, Herons, Flamingos: *Ciconiiformes*

Generally long-legged and large-billed, members of this order are primarily wading birds. Some are fishers, while others feed on small land animals or even carrion. The **Shoebill,** or **Whale-head,** while stork-like, is a grotesque species so distinctive that it has been allocated to a family all its own. Its common names refer to its enormous beak which is shaped like a wooden-shoe. A nocturnal inhabitant of the papyrus swamps of Central Africa, it feeds on fish, frogs and small mammals.

No species better typifies the stork family than the **White Stork** of Europe, Asia and Africa. This white and black bird, so familiar through legend and literature, is voiceless, expressing itself by a staccato rattling of the bill. The **Woolly-necked Stork** of tropical Asia and Africa is brown with fluffy white neck plumage.

The adjutants are Old World carrion feeders that received their common name from the fact that the **Indian Adjutant,** of southern Asia, frequents military parade

**SHOEBILL — central Africa**

grounds. The **Lesser Adjutant** is a smaller species that also ranges from India to Indonesia. The **Marabou** is common throughout much of tropical Africa. All adjutants are gray above, white below, and have nearly naked heads and necks; but only the African species bears the delicate white marabou plumes of commercial value.

The jabirus are characterized by a long, heavy beak that is straight above and upcurved below, giving the entire bill a slightly upswept appearance. The **Black-necked Jabiru** of tropical Asia and Australia is snow white and iridescent black with a jet black bill, while the **Saddlebill** of Africa has a beak that is red, black and yellow with a saddle-shaped yellow shield on top. The **American Jabiru** of Central and South America has white plumage, a naked black head and a black neck with a basal band of red.

Members of the ibis and spoonbill family differ from the stork group mainly in their smaller size and in the shape of their bills. That of the ibises is slender and sickle-shaped while that of the spoonbills is broad and flattened. The blood-red plumage of the **Scarlet Ibis,** of tropical South America, makes it the most strikingly beautiful of all ibises. Ranging from southern United States south to tropical South America, the **White Ibis** has black wing tips and reddish face, bill and legs. The **White-faced Glossy Ibis,** common in parts of southern California, is a dark brown bird with bronze iridescence. It inhabits marshes, pond borders and flooded fields. The **Black-headed Ibis,** which has snowy white plumage, represents the Old World sacred ibises in India, Ceylon and the Orient. The **Straw-necked Ibis** occurs in large flocks in many parts of Australia. Sometimes called "Pink Curlew," the **Roseate Spoonbill** has a naked, greenish head and pale pink plumage with a deep carmine patch on each wing. During the breeding season the under tail coverts become orange.

Flamingos hold a prominent place among the world's most beautiful and graceful birds; they also lay claim to one of the most highly specialized bills. Its sieve-like inner surfaces serve well to drain mud and water from the minute particles upon which flamingos feed: mollusks,

**AMERICAN or WEST INDIAN FLAMINGO**

**GREAT BLUE HERON — North and Central America**

crustaceans, insects, fish, blue-green algae and diatoms. Of all species the most richly colored is the **American,** or **West Indian, Flamingo.** Its spotty distribution includes Yucatan and widely separated areas in Central and South America. The **Chilean Flamingo** is smaller and paler and is further distinguished by blue legs with red joints. The **Greater Flamingo** of southern Europe, Asia and Africa is a large white bird with rose-colored wings; while the **Lesser Flamingo** is a miniature cherry-streaked form that occurs in India and Madagascar, and breeds in the Rift Valley lakes of eastern Africa.

The herons and their allies are primarily waders that feed on fish, frogs, and other aquatic life, including small mammals. The long beak of the heron is sharp and dagger-like, and can be used with terrific force as a weapon. The **Gray Heron** is found throughout Europe, Asia and Africa. It is similar to our **Great Blue Heron.** The **Nankeen Heron** of Australia has a reddish-brown body, a black crown and is similar to the gray- and black-bodied **Black-crowned Night Heron** of North and South America, Africa and Asia. The **Louisiana Heron** is found in the southern United States and the West Indies. A southern species, this graceful little heron is called "Lady of the Waters." The **Cattle Egret** is found throughout Asia and Africa and accompanies herds of elephants, buffalo or domestic cattle. The larger **American Egret** ranges in temperate and tropical America to Patagonia. Long white plumes, known as "aigrettes," grow on the back of this bird during the mating season. The **Snowy Egret,** found in both North and South America, has "aigrettes" that are much shorter, more delicate and recurved at the ends. The legs are black and the feet are bright yellow. The **Reddish Egret,** distributed throughout tropical America, is reddish-gray in color. The species has nested and raised young in our large shore and water bird flying cage, which you can walk through.

**HORNED SCREAMER — South America**

The **Boatbill** ranges from Mexico to southern Brazil. It resembles the night heron but differs in having a long, black crest and a widened beak that is three or four inches in length and some two inches in width. The plumage is pearl-gray above with the back, rump and tail a darker gray, while the crown and crest are blue-black. The breast and abdomen are cinnamon brown. A beautiful "war bonnet" crest is raised when the bird is frightened or angry. Though heron-like, the Boatbill is generally placed in a separate family.

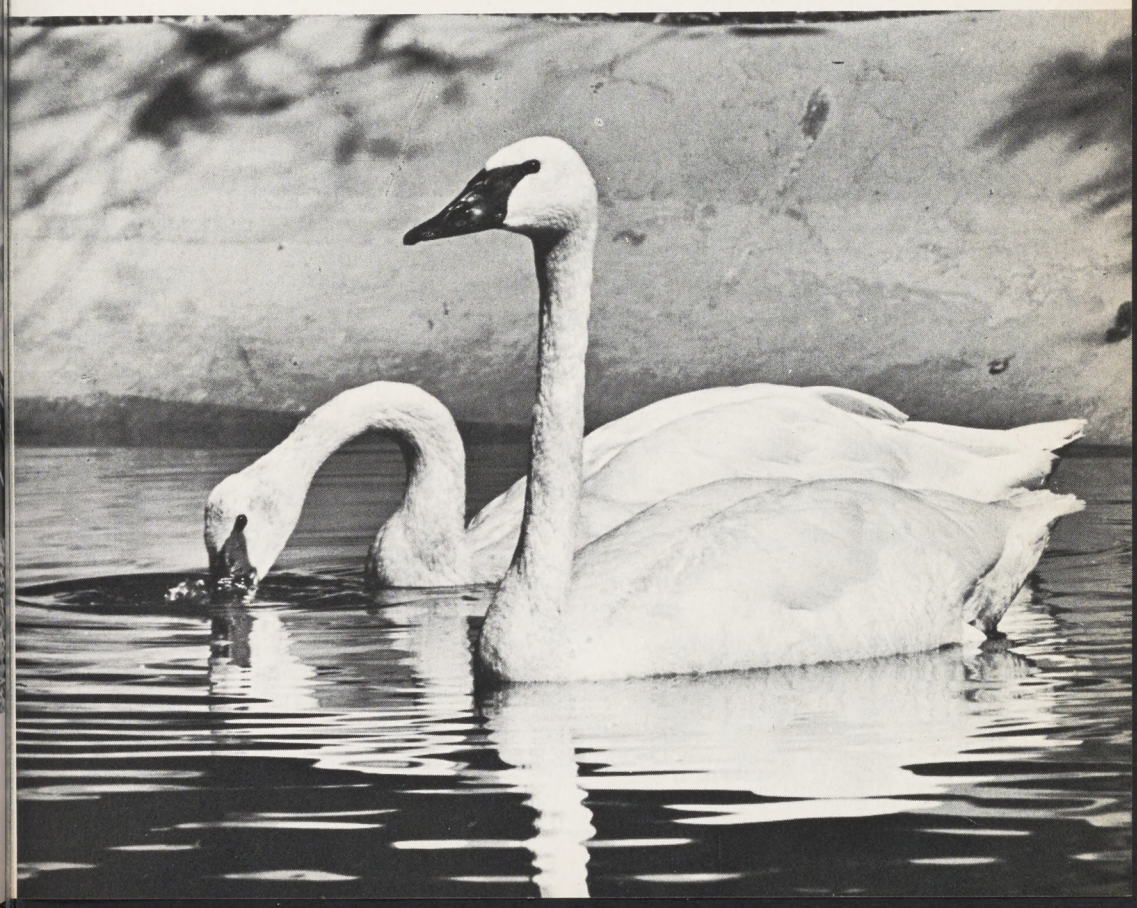
## Screamers, Swans, Geese and Ducks: *Anseriformes*

The screamer family, closely allied to that of the swans, geese and ducks, is limited to South America. Its members are turkey-sized birds with small heads and fowl-like beaks. Their legs are thick and strong, and the toes are remarkably long. Their wings are large and broad and each is armed with two powerful spurs, used chiefly for defense. The name, "screamer," refers to their shrill strident cries. The **Crested Screamer** of Paraguay, Brazil, Argentina and Uruguay is a smoke-gray bird with white cheeks and chin, a narrow black ring about its neck, and a conspicuous tuft of feathers on the back of the head. The feet, legs and the bare skin about the eyes are red. The **Black-necked Screamer** of Colombia and Venezuela is similar, but the black neckband is much broader. The **Horned Screamer** of tropical South America has a horn-like projection on the head.

The waterfowl family contains roughly 147 species, all swimming birds with comparatively short legs, webbed feet, long necks, as a rule, and broad "duckbills." Most are strong fliers and gregarious.

Largest of American waterfowl, and among the rarest, is the **Trumpeter Swan,** a dazzling white bird with black legs, feet and bill. The Zoo's pair was placed here

**TRUMPETER SWAN — North America**



**COSCOROBA — South America**

by the U. S. Fish and Wildlife Service in the interests of conservation and for possible captive propagation. Closely related is the **Whooper Swan** of northern Europe and Asia. Another white species is the **Whistling Swan** of North America which occurs wild in southern California during winter. The **Mute Swan,** the species most frequently kept in captivity, has a wide range from Europe to Mongolia. It can be recognized by the orange upper bill and the overhanging black knob. The **Black-necked Swan** of southern South America is white with a black head and neck. The knob on its bill is bright red. The **Black Swan** of Australia and Tasmania has glossy black feathers, those of the wings being curly. The **Coscoroba** of southern South America is a borderline bird which is most closely allied to the swans, although in shape and proportions it resembles a giant tree duck. It is white with a red bill and feet.

Tree ducks combine characteristics of the typical ducks, geese and swans. Their long necks and legs and high whistling voices are distinctive. Some members of this group are known to roost and nest in trees, hence the name. The **Fulvous Tree Duck** is a species which inhabits North and South America, Asia and Africa. It is dull brownish-yellow with a black bill. A closely related but smaller form, the **Lesser Fulvous Tree Duck,** is found in the East Indies and Australia. The **Black-bellied Tree Duck** is native to the American tropics. Its bright red bill is distinctive. The **Gray-necked Tree Duck** is a race that is restricted to Panama, northern South America and the Lesser Antilles. **Eyton's Tree Duck** is native to Australia.

The term, "goose," actually is a very vague one, for it is used to describe many birds which often are only distantly related.

The **Semi-palmate,** or **Magpie, Goose** is a rare and primitive form native to Australia and southern New Guinea. The first of its names arises from a partially webbed condition of its feet and the second from its black and white coloration. The **Egyptian Goose** is rusty-red with white wing coverts and bright red feet and bill. It occurs throughout most of Africa. The **Orinoco Goose** of the Orinoco and Amazon basins is a distant relative. This goose is

brown with green wings and white wing speculum. In the **Magellan Goose** of southern South America the male is white with black barring and the female is brown with black barring. In the smaller **Ashy-headed Goose** of the same region both sexes are colored alike, brown with black barring and with a gray head. The rare **Andean Goose** is white with black wings. The **Cereopsis Goose** of the islands off southern Australia is gray with a black bill and a large chartreuse cere. The **Maned Goose** is a minature species native to the Australian mainland. The **Abyssinian Blue-winged** is gray with blue wings.

The **Lesser Snow Goose** is white with black wing tips. It breeds in northern North America and Siberia and winters in temperate United States and Japan. **Ross's Goose,** similar but smaller, winters in California. The **Blue Goose** generally is restricted to eastern North America. The **White-fronted Goose** is a small, brown bird which breeds in the Arctic and winters south to Mexico, Japan and the Mediterranean. The **Bar-headed Goose** is an Asiatic species with conspicuous black bands on the head. The **Emperor Goose** inhabits the coasts of Alaska and Siberia.

Canadian Geese are represented in the Zoo by several forms, all of which have brown bodies, black necks, and white cheeks. The largest of these is the **Common Canada Goose.** Others include the **White-cheeked, Hutchins** and **Cackling Geese.** The **Black Brant** is a small marine member of the group. It breeds in the Arctic and migrates to southern California in winter. The **Barnacle Goose** breeds in northern Europe and Asia, and the seldom-exhibited **Red-breasted Goose** nests on the Siberian tundra. In color and marking it is the most striking member of its clan, but the **Nene** of Hawaii is much the rarest.

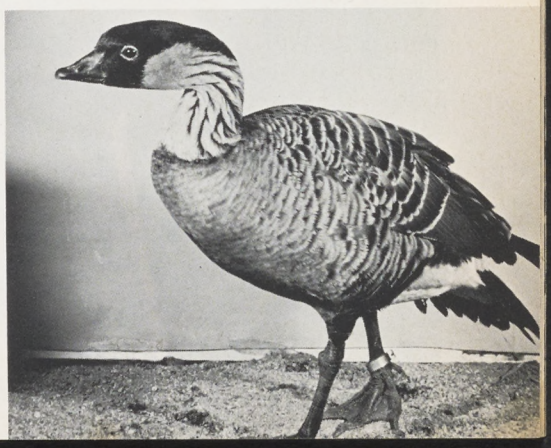
North American ducks are always well represented in the collection, and the following are to be looked for in the San Diego Zoo's pools: **Pintail,** of which thousands of wild specimens winter in the Zoo, **Green-winged Teal, Black Duck, Mallard, Gadwall, Baldpate, Blue-winged Teal, Cinnamon Teal, Common Shoveller, Canvas-back, Redhead, Ring-necked Duck, Lesser Scaup, Surf Scoter, American Goldeneye** and **Ruddy Duck.**

The **Wood Duck,** perhaps the most beautiful of North American ducks, breeds sparingly throughout the temperate parts of the continent and nests in trees. The closely related **Mandarin Duck** inhabits eastern Asia.

Of the many exotic ducks which the collection has contained, probably the rarest is the **Laysan Teal,** which inhabits Laysan Island, 800 miles west of Honolulu. Our birds were received as part of a joint program by the United States Fish and Wildlife Service, the Hawaiian Board of Agriculture and Forestry, and the Honolulu Zoo to establish breeding populations of this rare duck in captivity. Closely related is the **Hawaiian Duck** of the larger islands of the Hawaiian chain. Both are members of the mallard group, as are the **Spot-billed Duck** of eastern Asia and the **Australian Black Duck.** The **Bahama Pintail** is a white-cheeked species native to the Bahamas, the Antilles and northern South America.

The **European Widgeon** is a grayish duck with a cinnamon-colored neck and head and a gold forehead, and the **Chiloe Widgeon** of South America has a white forehead with a greenish-purple nape and hindneck. The **Garganey Teal** is a small Old World species which is chiefly gray in color with a white cresent over the eye. The little known **Andean Crested Duck** inhabits western South America at high altitudes. The **Wild Muscovy** is a large black duck of the American tropics, from which the domestic form is derived.

**NENE — Hawaii**



**PARADISE SHELDUCK — New Zealand**

The pochard, or diving duck, group has been represented by the **Tufted Duck** and **Red-crested Pochard** of Europe and Asia, **Baer's White-eye** of Asia, and the **Rosy-billed Pochard** of South America. The **European Shelduck** is white beneath, brown on the back, has a greenish-black head, a chestnut stripe across the breast, and a bright pink bill. The rare and beautiful **Paradise Shelduck** of New Zealand is truly a gem among waterfowl. The **Ruddy Shelduck** from India, the **Cape Shelduck** from Africa, and the **Chestnut-breasted Shelduck** from Australia also may be seen.

**SECRETARY BIRD — African plains**

**ANDEAN CONDOR—South America**

## Vultures, Eagles, Falcons and Hawks: *Falconiformes*

Seeking their food by daylight, these are chiefly flesh eaters and birds of prey.

Distinctive enough to merit a family of its own, the **Secretary Bird** is a long-legged, long-necked, hawk-like bird that inhabits the African veldt. It eats small mammals, small birds, reptiles and insects.

The New World vultures are slow, sluggish birds that feed on carrion and have slightly hooked beaks and perforated nostrils. The feet have no grasping power. These birds excel in soaring. The **Andean Condor** inhabits western South America from Venezuela to Patagonia. This is the largest of the birds of prey. One male on exhibit has a wingspread of ten feet, two inches from tip to tip. In color the male condor is glossy-black with an ashy-white bar across each wing. The base of the neck has a beautiful ruff of snow-white down resembling a lady's powder puff. Nine Andean Condors have been hatched and raised in the San Diego Zoo. The **California Condor** is among the rarest of North American birds. It now appears to be limited to Southern California, being most numerous in a protected area in the mountains of Ventura County. This great vul-

ture has a wingspread of from eight-and-a-half to nine-and-a-half feet. It feeds chiefly on carrion. The species was exhibited here for eleven years.

The **Black Vulture** is found throughout the whole tropical and warm temperate sections of America. Within the United States this small vulture is mainly an eastern bird. The **Turkey Vulture,** or **Turkey Buzzard,** is one of the most familiar and widely distributed members of this group. The **King Vulture** lives in tropical America, from Mexico to northern Argentina. This vulture is the most brilliantly colored and striking of all. It is a forest-loving bird, and four years are required for it to attain mature plumage.

With a few exceptions, the Old World vultures are large birds with strong feet, rather blunt claws and featherless head and neck.

The **Griffon,** or **Fulvous, Vulture** ranges over southern Europe to India, prefers open country, and nests on rocks. The **Hooded Vulture** of southern Europe, Asia and North Africa is a large, dark brown bird, with a tremendous beak and a down-covered head.

The term, "eagle," usually is applied to large hawks noted for their strength and ferocity. Unlike vultures, they have the ability to clutch with their feet. As a general rule, eagles feed on living prey. The **Golden Eagle** has the widest distribution of any species. It is native to Europe, Asia, North Africa and North America south to central Mexico. The **Bald Eagle** of North America is brown with a white head and tail. It feeds mainly on fish and is found only near water. The closely related **Steller's Sea Eagle** of northern Asia is the largest of all fishing eagles. The short-tailed **Bateleur** inhabits Africa, while the enormous **Wedge-tailed Eagle** is found in Australia. The spectacular **Monkey-eating Eagle** of the Philippines is a seldom-exhibited forest-dwelling species. The **African Crowned Eagle** has a brown body with salmon-colored flecks and a high crest. The crested, gray and white **Harpy** of the American tropics also has been exhibited in our Zoo.

Among native hawks on exhibit are the familiar **Red-tailed Hawk** and the **Swainson's Hawk.**

The **Hawaiian Hawk,** or **Io,** is found only on the island of Hawaii. It has two color phases, dark brown and buff.

The **Brahminy Kite,** which ranges from India to Australia, is a striking red and white bird with the entire back red and the front white. Each feather is faintly penciled with black. It is a fish eater.

Members of the falcon family obtain their food by striking it while on the wing. Their savage disposition, swiftness of flight and keen vision are the reasons for their centuries-long employment in the art of falconry. The **Duck Hawk,** or **Peregrine Falcon,** has an almost cosmopolitan distribution. Among birds it has no superior and is truly one of the most beautiful of our North American hawks. The **Australian Kestrel** is a small, fast-flying form, while the **Red-thighed Falconet** of Thailand and Burma measures only six inches in length. It feeds on insects and occasionally small reptiles. The **Collared Forest Falcon** of Mexico is a barred black and white bird restricted to dense jungles. The caracaras are vulture-like falcons that are chiefly carrion eaters. **Audubon's Caracara** ranges from the southern border of the United States south through Mexico to Guiana and Ecuador. The **Carunculated Caracara** is native to Colombia and Ecuador. The **Chimachima,** or **Yellow-headed Caracara,** is a small species that occurs from Panama to Argentina.

**RED-THIGHED FALCONET — southeast Asia**

**GREAT ARGUS PHEASANT—Malaya and Sumatra**

## Pheasants, Quails, Grouse and Other Fowl-like Birds:

### *Galliformes*

This order is a large one of world-wide distribution. It contains mound builders, curassows, grouse, pheasants, poultry, guineafowl and turkeys.

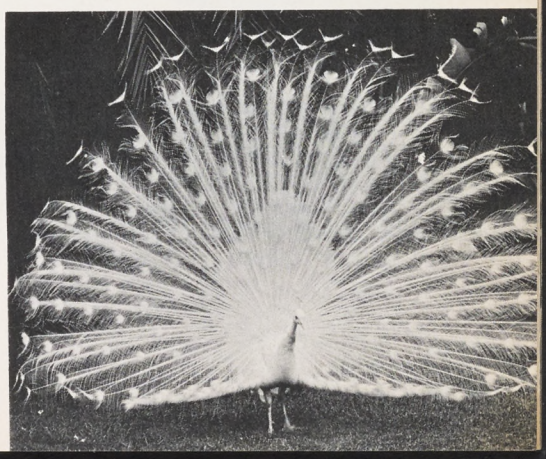
The megapode family is a small one composed of fowl-like birds that lay their eggs in mounds of rotting vegetation, warm volcanic soil or sand, allowing the temperature of the nest material to take care of the incubation process. Upon hatching, the young are well feathered and can fly as soon as their plumage is dry. Megapodes occur south from the Nicobars and the Philippines to Australia and east to central Polynesia. A large species often seen in zoos is the **Brush Turkey** of northeastern Australia.

Curassows, guans and chachalacas are native to the forests of tropical America. Curassows are large and heavy with powerful legs and feet. The **Crested Curassow** occurs from Mexico south to Ecuador, while the somewhat similar **Red-wattled Curassow** inhabits Brazil. The wattle at the base of the bill in both sexes is red. The **Razor-bill Curassow,** so-called because of its vertically compressed red beak, is native to the Amazon forests. Guans, smaller birds than the curassows, have similar habits. The general color is black or brown with variations. The **Purplish Guan** inhabits most of Central America and Mexico. The **Crested Guan** and **Pileated Guan** come from Brazil. The chachalacas are still smaller than the guans. Their general color is olive-brown. The **Red-tailed Chachalaca** of Venezuela is exhibited in the large flying cage. The **Northern Chachalaca** is found from southern Texas to Mexico.

Pheasants are ground-loving birds which run with great speed and always prefer to trust their legs rather than their wings. Many of the species live well and breed easily in captivity. The **Great Argus Pheasant** of the Malay Peninsula and Sumatra is the largest of all pheasants. Its two central tail feathers may reach a length of more than four feet. Among the most beautiful game birds, the **Impeyan,** or **Monaul, Pheasant** of the mountains of central Asia has brilliant metallic plumage of iridescent blue, green, purple and red. **Reeve's Pheasant** and **Elliot's Pheasant** are strikingly plumed birds native to China, as are the **Ringneck, Golden, Silver** and **Lady Amherst Pheasants.**

Jungle fowl, closely related to the typical pheasants, are the ancestral forms from which domestic chickens were derived. The **Red Jungle Fowl** which, with the peafowl, roams at liberty throughout the Zoo is native to Asia, from India to Indonesia and has been introduced to many Pacific Islands. The **Gray Jungle Fowl** is native to western and southern India and the **Green Jungle Fowl** inhabits Indonesia.

**WHITE PEAFOWL—a domestic form**



Peafowl may safely be termed the most magnificent of the feathered tribe. These birds are recognized at once by the beautiful trains displayed by the males. The **Blue Peafowl** from India and Ceylon and the **Green Peafowl** from Burma, Siam, Malaya and Java are shown.

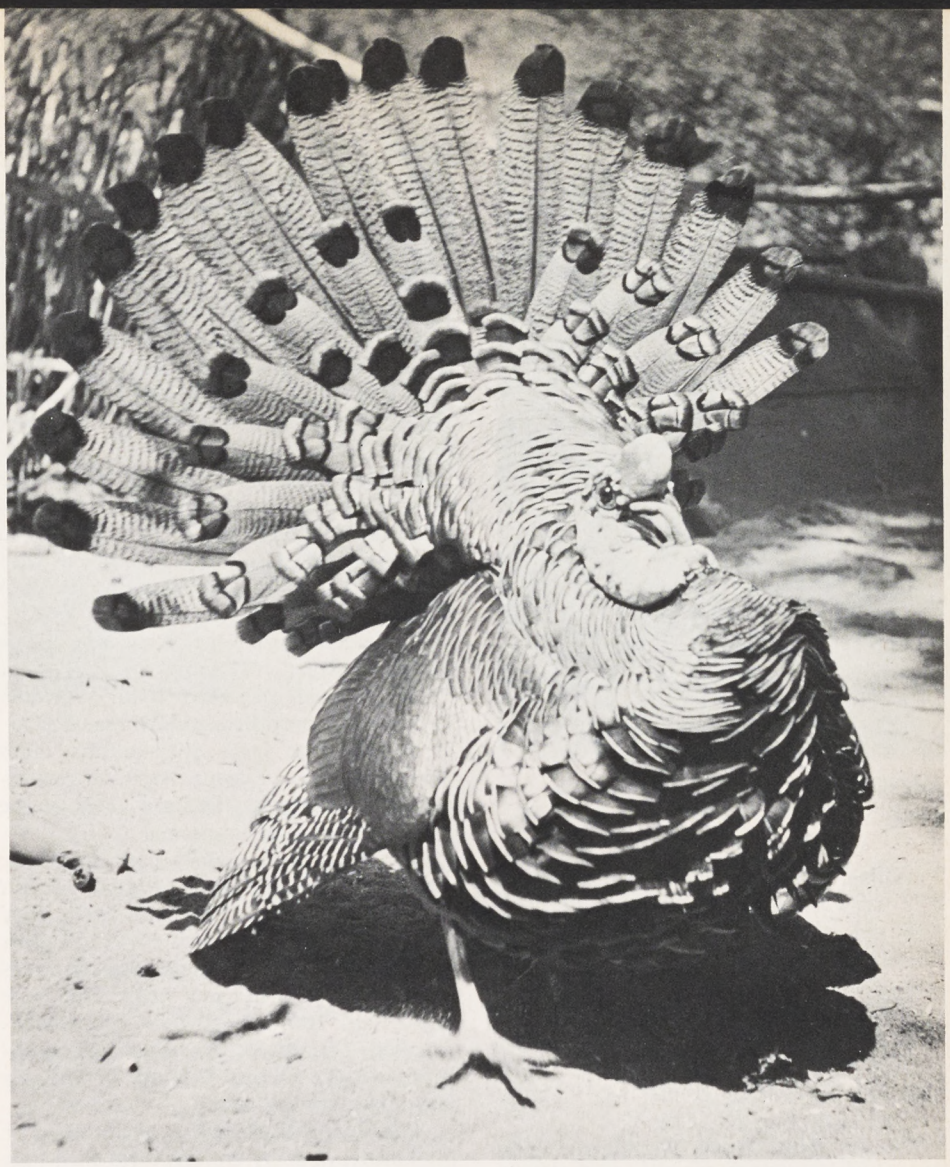
Quails and partridges are small members of the pheasant family. Best known of all American species is the **Bob-white,** or **Virginia Quail.** The **Masked Bob-white** is a nearly extinct form native to Arizona and Sonora. The **Mearn's Quail,** or **Fool's Quail,** has a "clown face," a bushy crest and a rotund build. It ranges from Arizona and Texas to southern Mexico. The **California Quail,** an elegant, graceful and lively native, wins new friends every day with its little bobbing crest. It is seen throughout the gardens in complete freedom. The **Rain Quail** is limited to southern Asia and Ceylon; while one of the smallest of all the quail clan, the **Painted,** or **"Button," Quail** ranges from India east to China and south to Australia. The **Chinese Bamboo Partridge** is a handsomely marked species native to China and Formosa. The **Chukar Partridge** of Europe and Asia has been introduced as a game bird in the United States. **Sharp's Francolin** is a partridge-like bird native to Ethiopia.

**MEARN'S QUAIL — Arizona and Mexico**

**VULTURINE GUINEAFOWL — East Africa**

Although wild guineafowl occur in southeastern Arabia and Madagascar, most species come from Africa. Some thirty-five forms are known. The domesticated guineafowl is believed to have been derived from the **West African Helmeted Guineafowl.** The **Vulturine Guineafowl** of the East African deserts is so named because of its naked head.

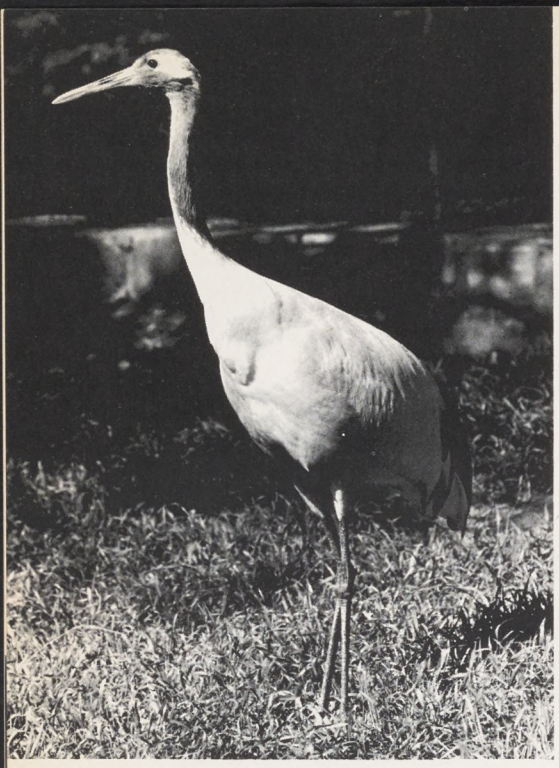
Turkeys, the largest and heaviest of the game birds, are too well known as domesticated birds to need description. The **Wild Turkey** ranges from the Atlantic states to the Dakotas, and from southern Ontario to southern Mexico. Rarest of the family is the beautiful **Ocellated Turkey** of Yucatan, Guatemala and British Honduras. It is so named because of the "ocelli" or eyespots on the terminal ends of the feathers.



**OCELLATED TURKEY — Yucatan Peninsula**

## Cranes, Rails and Trumpeters: *Gruiformes*

Cranes are long-legged, long-necked birds similar to the herons but distinguished from them in flight by the fact that they extend their necks full length. Certain elongated wing feathers provide a long sweeping cover for the short tail, adding grace and beauty. The **Manchurian Crane** is a large black and white species which nests in Siberia and migrates to China and Japan. **Lilford's Crane** also inhabits Asia. Similar are the **Little Brown Crane** of western North America and the **Florida Sandhill Crane.** The **Sarus** of India is the largest of all cranes. The **White-naped Crane** is a lovely bird native to eastern Asia. Smallest of all is the **Demoiselle** of southern Europe, western Asia and North Africa. The closely related **Stanley,** or



**MANCHURIAN CRANE — eastern Asia**

**Paradise, Crane** occurs in South Africa. The Crowned Cranes of Africa are characterized by their lovely gray and black plumage, pink and white cheek patches and golden crests. We have exhibited two forms here: the **Cape** and the **Sudanese.**

Rails are small birds, living in swampy, marshy regions, with very secretive habits. The rails have long slender toes, a compressed body and short tail.

Of our native North American species the **Light-footed Rail,** the smaller **Virginia Rail** and the little **Sora** with its short, stout bill are to be seen in the Tropical Rain Forest. Also in the Rain Forest is the **African Black Crake** with its yellow bill and red legs. The **Cayenne Wood Rail** is from the American tropics, and the **Tasmanian Swamp Hen** is one of the largest members in this family. Gallinules are birds with a rich and variegated plumage. The **American Purple Gallinule** is found in the tropical and subtropical regions of America. The head, neck and breast are deep blue; the back and wings are olive green. The frontal shield is bright blue and the beak is red. The legs are a brilliant yellow. The **Black-backed Gallinule** of Australia is one of the largest gallinules and is similar in coloration, but the colors are not so vivid. The **Hawaiian Gallinule** is a smaller, duller species. Coots are black dumpy birds closely related to the rails and gallinules. Both the native **American Coot** and the **Yellow-billed Coot** of South America have been shown here.

The **Kagu** is confined to the island of New Caledonia. Uniform gray-blue, it has a long crest which it spreads when frightened or courting.

Seriemas are tall, long-legged birds with slightly hooked beaks. Their diet includes snakes, lizards, small mammals and insects. The **Crested Seriema** is brownish and is found in Brazil, Argentina and Paraguay, while the small gray **Burmeister's Seriema** occurs only in northwestern Argentina.

Bustards are large open-country birds native to Africa, Europe, Asia and Australia. The **Australian Bustard** inhabits the plains of the arid interior.

The trumpeter family contains three species, all inhabitants of dense South American jungles. Pheasant-sized, they have long legs and necks, fowl-like bills and mostly black plumage that becomes velvety on the head and neck. The male has a loud, trumpeting voice. The **Green-winged Trumpeter,** the **Dusky Trumpeter** and the **White-winged Trumpeter** have been shown here.

The **Sun Bittern,** the only member of its family, is a shy and graceful bird that haunts stream banks of tropical forests

**SUN BITTERN — Tropical America**

BLACK JACANA — South America

AUSTRALIAN STONE CURLEW

from Mexico to Brazil and Bolivia. When it displays, the gold, brown and reddish bands on its wings and tail form concentric arcs that resemble the sun and its rays.

## Shore Birds and Gulls:
### *Charadriiformes*

The jacanas, or lily trotters, are chiefly tropical birds that inhabit marshes and ponds. Their long toes and toenails enable them to walk with ease over floating vegetation. Other distinctive features include a frontal shield and sharp horny wing spurs. The **Black Jacana** of upper Amazonia has been shown here.

Oyster-catchers are stout-bodied birds with strong awl-shaped red bills and black and white or brown plumage. The **American** and **European Oyster-catchers** are closely related forms that occur on opposite sides of the Atlantic.

True plovers are short-legged shore or plains birds with rounded heads and prominent eyes. The **Killdeer** is a well known American species, while the **European Lapwing** is a widely distributed Old World form. The **Pacific Golden Plover** breeds in the Arctic and migrates in winter to India, Australia and Hawaii. Likewise, the **Black Turnstone** nests in the north and visits southern California during the colder months.

The sandpiper family contains birds of diverse size, shape and appearance. Some have slightly upturned bills, others have sickle-shaped bills, while that of the **Willet** is stout and straight.

Stilts and avocets are graceful marsh birds with slender upcurved bills. The **Black-necked Stilt** is a local form while the **Black-winged** occurs in Asia, Africa and Europe; and the **Brazilian** inhabits tropical South America.

Distinctive among shore birds are the large-eyed, nocturnal **Stone Curlews,** so named because of their fondness for rough pebbly areas. Standing between one and two feet high, they have long legs, short bills, broad heads, and usually are brownish streaked with gray and black. **South American** and **Australian Stone Curlews** are exhibited here.

The **Oriental Pratincole** is a swallow-winged shore bird belonging to an Old World family that seldom is seen in zoos.

Gulls are plentiful along sea coasts and lake shores in most parts of the world. Local forms include **Heermann's, Ring-billed, Herring, California** and **Western Gulls,** while the dark-headed **Franklin's** and **Laughing Gulls** occur elsewhere in North America. The **Great Black-backed Gull** is a bird of the North Atlantic, while the **Kelp Gull** takes its place in the Southern Hemisphere. Red feet and bill and immaculate gray and white plumage make the **Silver Gull** of Australasia, New Zealand and South Africa one of the most attractive members of its family.

## Pigeons and Doves:
### *Columbiformes*

A large and diverse family, this group contains creatures that range in size all the way from birds not much bigger than sparrows to some as large as pheasants. Easily the most spectacular of the lot are the crowned pigeons of New Guinea and islands close by. All three species are richly colored in blues and maroons and have enormous, delicately plumed crests. Both the **Great Crowned Pigeon** and the **Victoria Crowned Pigeon** have reared young in the Zoo. The **Nicobar Pigeon,** gun-metal gray with iridescent gold and green, has a ruff of long slender hackle-feathers; the species inhabits offshore islands from the Nicobars to New Guinea. Other impressive pigeons usually to be seen here are: **Triangular-spotted** from Africa; **Common Bronze-winged, Brush Bronze-winged** and **Crested** from Australia; **Imperial** from Malaysia and India; our own **Band-tailed; White-crowned** from southern Florida and the West Indies; and the **Bleeding-heart** from the Philippines.

In general, doves are smaller than pigeons and have tapering tails rather than short, square ones. While largely tropical in distribution, the **Inca, White-winged** and **Common Ground Doves** also are found in desert areas of the southwestern states. Other New World species that do not occur within the United States are **Galapagos, Picui,** and **Cassin's Doves,** while Africa is represented by **Cape, Emerald-spotted** and **Senegal Doves,** Australia by **Bar-shouldered, White-bellied Plumed** and **Diamond Doves,** and Asia by the **Green-winged, Dwarf Turtle** and **Pearl-necked Doves.** The **Black-fronted Amethyst,** a lovely little bird that inhabits the Tropical Rain Forest, is native to New Guinea.

**GREAT CROWNED PIGEON — New Guinea**

## Cockatoos and Parrots:
### *Psittaciformes*

Similarly, members of the parrot order and family exhibit an amazing diversity of size, shape, coloration and behavior. All species, however, are characterized by the distinctive parrot bill in which the upper mandible overhangs the lower. The singular ability of many parrots to mimic the human voice is due in part to the structure of the short, thick, fleshy tongue. Each zoo has its strong points, and in San Diego one of these is an unusually extensive array of psittacine birds.

One rare species that has repeatedly produced young here is the **Kea** of the mountains of South Island, New Zealand. A

**KEA — New Zealand**

**WHITE-TAILED BLACK COCKATOO — Australia**

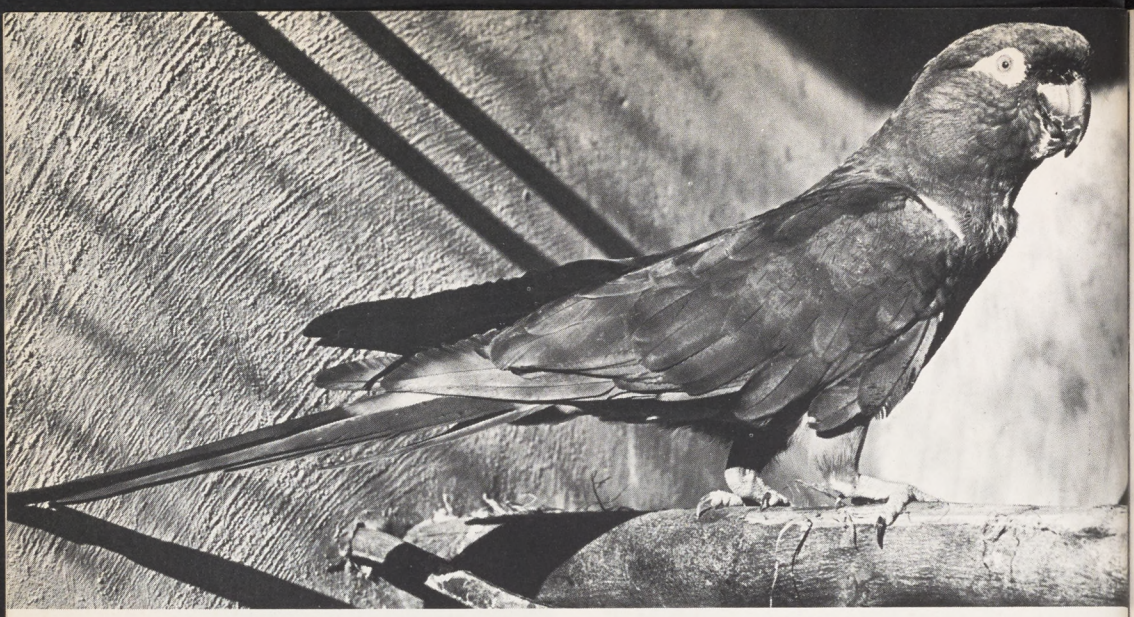
known meat-eater, it has gained the reputation of being a sheep-killer. Due to resulting persecution, it has become scarce in the wild.

Lories, which are for the most part small birds, are among the most brilliantly colored of all parrots. Unique is the brush-like surface of the tongue, a feature that enables its bearer to extract nectar from the blossoms of trees. Lories also feed upon soft fruits. The group is distributed from the Philippines to Australia and is represented on many Pacific isles. **Blue Mountain** and **Red-collared Lories** of Australia and the **Yellow-backed Lory** from the Moluccas are among the 23 different forms that have been exhibited here.

Cockatoos form a well-defined group of medium to large-sized parrots that possess conspicuous frontal crests and lack green in the plumage. Like lories, they range from the Philippines to Australia. Among cockatoos usually to be seen here are: **Great Black, Banksian,** or **Red-tailed Black, Yellow-tailed Black, White-tailed Black, Helmeted, Greater Sulphur-crested, Triton, Molucca, Leadbeater's, Bare-eyed, Slender-billed** and **Rose-breasted.** The **Cockatiel** is a small gray bird from Australia. Its high crest indicates a relationship with the cockatoos.

Largest of all parrots are the macaws, which occur from Mexico south through the American tropics. They are to be distinguished by their tremendous beaks, long tails and spendid coloring. Giant of the clan is the **Hyacinthine Macaw** from central Brazil. It is deep blue with bright yellow facial skin and cere. The **Military Macaw** reaches northern Mexico while the **Scarlet** ranges from southern Mexico to Amazonia. The **Green-winged** and **Blue-and-yellow Macaws** are largely restricted to the tropical forests of the northern half of South America.

Conures bring to mind miniature macaws and are likewise limited to Mexico, Central and South America and the West Indies. **Petz's, Brown-throated, Black-headed Nanday, Patagonian,** and **White-eared Conures** usually are exhib-



**PATAGONIAN CONURE — South America**

ited. The allied **Thick-billed Parrot** of northern Mexico is the only psittacine which yet occurs within the United States when, upon occasion, it wanders into the coniferous forests of southern Arizona.

The Amazon group contains more than 50 kinds of tropical American parrots. All are medium-sized with short, broad tails, strong bills and a swollen naked cere; and most are primarily green. Amazons are hardy in captivity and popular as cage birds. Typical representatives include: **Yellow-naped, Yellow-fronted, Single Yellow-headed** and **Double Yellow-headed** (all names referring to the position and extent of yellow about the head) and **Mealy, Finsch's, Blue-fronted, Spectacled, Green-cheeked, Salvin's, Blue-crowned** and **Orange-cheeked.**

A great variety of smaller parrots inhabit tropical America: the **Hawk-headed Caique,** or **Fan Parrot,** of Amazonia has an extensive crest of blue and red; the **White-crowned Parrot, Red-vented Parrot** and the **White-bellied Caique** are shy jungle-dwellers; the colonial **Gray-breasted,** or **Quaker, Parrakeet** of South America is the only psittacine known to construct a stick-nest rather than to lay its eggs in tree-holes; **Tovi** and **Lineolated Parrakeets** are small, fast flying and gregarious.

Most African parrots have gray or brown in their plumage. The **African Gray Parrot** is a large species with a red tail and a melodious voice. It may become an excellent talking bird. The **Senegal Parrot** of western Africa has a brilliant yellow breast. Smallest of African psittacines are the familiar lovebirds which normally are green with yellow, red, orange, or black in the plumage. **Peach-faced, Nyasa** and **Masked Lovebirds** are seen in pet shops.

**Eclectus** parrots from the South Pacific are distinguished by the fact that the scarlet and blue females are more brightly colored than the males, which are green with red side-patches. The **Solomon** and **Red-sided Eclectus Parrots** differ only slightly from other races of the species.

Southern Asia and adjacent islands are inhabited by a group of slender, powdery green parrots with exceptionally long slim tails. The male of the Indian **Blossom-headed Parrakeet** has a purplish head edged with pink; the **Ring-necked Parrakeet,** which occurs from southeastern China west to western Africa, has a narrow collar and suggests a small edition of the **Indian Hill Parrot;** the **Banded,** or **Moustached, Parrakeet,** ranges from the Hima-

layas to Borneo, while the rare, blue-breasted **Derbyan Parrot** occurs only in Tibet and China.

The parrot order reaches its greatest diversity and numerical density in Australia where gum forests, grain fields, and tropical jungles are inhabited by swarms of rainbow-hued parrakeets. The rosellas are represented by one form or another from east to west and north to south: **Pennant's, Eastern, Brown's, Yellow, Pale-headed** and **Western Rosellas.** Closely related are the more somberly-colored birds collectively referred to as "Australian ringnecks": **Barnard's, Conclurry, Yellow-banded** and **Port Lincoln Parrots. Barraband, Black-tailed** and **Princess Alexandra's Parrots** prefer more open forests, while the **King** and the **Crimson-wing** resort to denser vegetation. The gaudy **Pileated Parrot** inhabits gum forests in southwestern Australia. Smaller and more delicately-colored is the **Blue Bonnet,** while the **Red-rump,** the **Hooded** and the exceedingly rare **Golden-shouldered Parrakeets** are smaller still. Grass parrakeets, of which the well known **Budgerigar,** or **Shell, Parrakeet** is one, are mainly seed-eaters.

## Cuckoos: *Cuculiformes*

Coucals are large terrestrial cuckoos with strong hooked beaks, heavy bodies and long tails. They inhabit thickets and reed-beds in Asia, Africa and Australia. Typical of the group is the black and rust-red **Indian Coucal.**

Ground cuckoos are birds of rather dull plumage that have powerful legs and feet adapting them for life on the ground. They have short, rather weak wings and long tails. The **Roadrunner,**or **Chaparral Cock,** of southwestern U. S. and northern Mexico runs with astonishing speed.

Closely related to the cuckoos are the touracos of Africa. Best known of the family are the green touracos, which are forest birds. Their body plumage is dull green, while their wings are deep red. The wing feathers contain a water-soluble pigment, known as "turacin." Sometimes seen here are: **Donaldson's Touraco** and **Hartlaub's Touraco** of East Africa, and the **White-crested Touraco** of South Africa.

## Owls: *Strigiformes*

Owls are characterized chiefly by their forward facing eyes set in a pronounced facial disk, strong grasping feet, hooked beaks, large heads set on seemingly short necks and soft fluffy plumage that enables silent flight. All owls are meat-eaters, and most are nocturnal. The order contains two families: the typical owls and the barn owls.

The **Barn,** or **Monkey-faced, Owl** is perhaps the most familiar of all species, since it enjoys an almost cosmopolitan distribution. Of North American species, the horned owls are perhaps the next best known; the **Great Horned Owl** of eastern North America, the **Western** and the **Dusky** of the Pacific states usually are exhibited. Other native species include the eastern and southern **Barred Owl,** the **Long-eared Owl,** the diminutive **Screech Owl,** the diurnal **Burrowing Owl** of the southwest, and the tiny **Elf** and **Pygmy Owls.** The **Snowy Owl** is a circumpolar species that is diurnal and prefers the snow countries of the far north, while the magnificent **Great Gray Owl** inhabits coniferous forests in northern Asia, Europe and North America. Allied to our Horned Owls is the **European Eagle Owl,** while the spectacular **Fishing Owl** of Malaya and Indonesia has no New World counterpart. The **Spectacled Owl** of the American tropics has a conspicuous ring around

**EUROPEAN EAGLE OWL**

TAWNY FROGMOUTH — Australia

each eye. The smallish **Boobook** is a typical owl native to Australia, while the **Masked Owl** represents the barn owls in the "land down under."

## Frogmouths: *Caprimulgiformes*

The nocturnal frogmouths of southern Asia and Australasia resemble enormous nightjars. Actually they do belong to the same order, although they are classified in a separate family. Their large, triangular and sharply hooked bills are distinctive and are employed in catching beetles, centipedes, scorpions, caterpillars and even mice. While nightjars are mainly aerial feeders, frogmouths capture most of their prey on the ground. The **Tawny Frogmouth** is not often seen in zoos but is a common bird throughout Australia.

## Colies or Mousebirds: *Coliiformes*

Colies, found only in Africa, are slender-bodied birds with prominent crests and exceedingly long, thin tails. All are somber gray or brown with red feet and legs and often with patches of red skin about the eyes. Colies inhabit forest and bushland, creeping along branches in rodent-like fashion and feeding largely on fruits. The **Striated Coly** of South and East Africa is gregarious and sometimes occurs in large flocks.

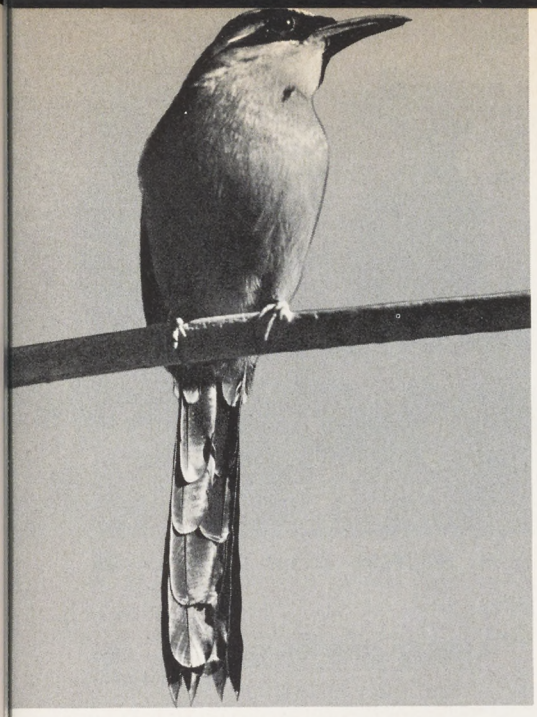
## Trogons: *Trogoniformes*

Trogons are to be included in any list of the world's most beautiful birds. They are forest dwellers that inhabit the New and Old World tropics. All species are noted for their brilliant plumage, but the **Quetzal**, or **Resplendent Trogon**, of southern Mexico and Central America is easily the most spectacular, the male being distinguished by streaming, coppery-green "tail" plumes. The **Cuban Trogon** is a small species with a green back, purplish head, gray breast and a red vent and bill.

## Kingfishers, Motmots, Rollers and Hornbills: *Coraciiformes*

Kingfishers form a well-marked group, all of them being remarkable for their long bills, the comparative shortness of their

CUBAN TROGON



**BLUE-CROWNED MOTMOT — Tropical America**

bodies and their erect bearing. The **Belted Kingfisher** is a common American species that is to be seen all along the Pacific Coast. Curiously, the fish-catching kingfishers do not do well in captivity, therefore few are exhibited. The **Giant Kingfisher** or **Kookaburra,** sometimes called "**Laughing Jackass,**" is the national bird of Australia. Like the **White-collared Kingfisher,** which ranges from Africa through southern Asia to Australia and the Pacific islands, it is a woodland bird that feeds on insects, small reptiles, birds and mammals.

Motmots are a small group of birds with green, blue, cinnamon and black in their loose-webbed plumage. These forest birds are found exclusively in the New World. The crow-like bill is provided with saw notches which are razor sharp. In most species of motmot the central tail feathers are longer than the others and terminate in racket-shaped tips. Represented in the collection are **Russet-crowned** and **Blue-crowned Motmots,** both of Mexico and Central America.

Hornbills stand high among Nature's more grotesque creations. Enormous bills, which in some species support large casques or helmets, conspicuous eye-lashes, and large size all contribute to a spectacular appearance. Their bills and casques are not as heavy as would appear, having a 'honeycomb" internal structure. Hornbills inhabit the forests of the warmer parts of the Old World from Africa through southern Asia and Indonesia to New Guinea.

One of the largest is the **Concave-casqued Hornbill** of India and Malaya. The species has nested in the Zoo, exhibiting the nest-plastering technique for which hornbills are noted. The female enters a hole in a hollow tree and with the help of the male walls up the nest opening with excrement and mud, leaving a small aperture just large enough to permit the male to insert food. Throughout the incubation period and the infancy of the chicks, the female is safe from predators. When the young are old enough to fly, they and the mother emerge from the nest. Other species of hornbill which have been exhibited here include the **Philippine Rufous Hornbill,** the **African Red-billed Hornbill,** the **Malayan Wreathed Hornbill,** and the **Papuan Hornbill,** which occurs from the Moluccas to the Solomons. The African ground hornbills are large terrestrial birds with black and white plumage and black bills and casques. The **North African Ground Hornbill** is shown here.

Rollers are medium-sized, insectivorous birds which inhabit the warmer regions of Africa, southern Europe, Asia and Australia. The name roller refers to the spectacular aerial acrobatics these colorful birds perform. The **Indo-Chinese Blackbilled Roller,** while not so brightly colored as some, is typical.

The eye-catching **Hoopoe,** which has a family all to itself, commands notice wherever it occurs. Its delicate fawn color, its black-tipped crown, and the strong black and white wing and tail bands that show conspicuously in flight make it unmistakable. Hoopoes feed mainly on the ground, probing in the earth and rotted logs with

HOOPOE — Europe, Asia and Africa

their long bills for worms, grubs, ants and other small animal life. The species ranges over southern Europe and Asia and southward into Africa and Madagascar.

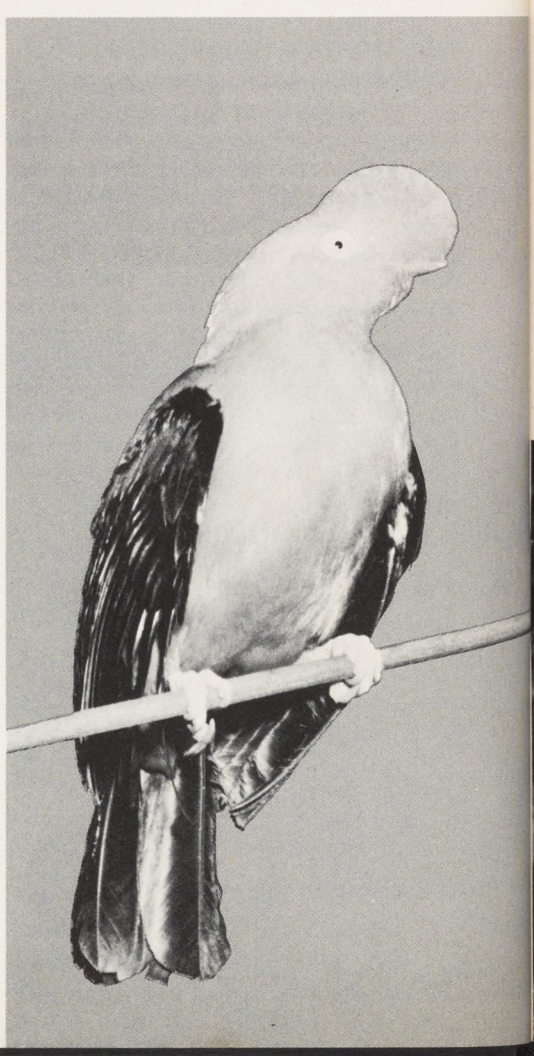
## Barbets, Toucans and Woodpeckers: *Piciformes*

Birds of this order differ greatly from each other, but they share many characteristics, the most important of which is that the toes (two directed forward and two backward) are moved by an arrangement of muscles found in no other bird.

Barbets are gaudy, chunky little birds with short necks, big heads, large bills and hair-like bristles about the nostrils. Barbets inhabit tropical forests in the Americas, Africa and Asia. Foraging through the treetops, they feed largely on insects, though some kinds eat fruits and blossoms. Their chisel-bills are put to use in excavating nest holes in tree trunks, banks or termite nests. The handsomest members of the family are Asiatic and include the **Great Himalayan Barbet,** the **Blue-crowned,** the **Black-banded,** the **Lineated,** the **Fire-tufted** and the **Crimson-breasted.** The Tropical Rain Forest contains examples of several of these.

The curious toucans are no less remarkable than hornbills, their beaks being as large in some species and their coloring far superior. They are confined to the New

APRICOT COCK-OF-THE-ROCK — Peru and Ecuador



World, and are distributed over wooded districts from Mexico to northern Argentina, being most numerous in the forests of the Amazon. Their large, painted bills and long, fringed tongues extending the entire length of the beak are distinctive. The huge beak is light in weight; the outer wall of the bill is said to be only one-thirtieth of an inch thick. In captivity these birds live well on fresh fruits — grapes, bananas, apples, pears, soaked raisins, oranges — plus insects, hard-boiled eggs, bread, milk, lettuce and an occasional mouse. The plumage is brilliant, black or green bodies being ornamented with red, orange, white and blue. Among the species to be seen here from time to time are the **Toco, Swainson's, Ariel, Short-keeled,** the **Emerald Toucanet,** the **Collared Aracari** and the **Black-banded Aracari.**

Woodpeckers are not easily maintained in captivity, because of a specialized diet of ants and other insects. The Local Bird Cage in the Children's Zoo usually contains examples of native woodpeckers, including the familiar **Red-shafted Flicker,** a brown, black and red species that has largely resorted to feeding upon the ground, chiefly on ants. The **Golden-fronted Woodpecker** of southern Texas and Mexico has been exhibited in the collection, as has the richly colored **Golden-backed Woodpecker** of India and Ceylon.

## Perching Birds: *Passeriformes*

Perching birds form the largest avian order. The group contains approximately seventy-five families and about half the known forms of birdlife. Although hundreds of species have been exhibited in the San Diego Zoo, only representative examples can be mentioned here.

The cotinga family of the American tropics and subtropics contains many brilliantly-colored birds. The **Orange Cock-of-the-Rock** of northeastern South America is characterized by orange and brown plumage, a half-moon crest, and wavy feathers on the back. The larger **Scarlet Cock-of-the-Rock** of western Colombia is red and gray, and its crest is thick and full. The similar **Apricot Cock-of-the-Rock** of Ecuador and Peru has more delicate coloring. The **Bare-throated Bellbird** is a white cotinga of southeastern Brazil. Its voice resembles a clear ringing bell.

Pittas, or "jewel thrushes," are small and often brilliantly-colored ground birds that inhabit dense tropical forests from Africa through southern Asia and Indonesia to Australia. The lush undergrowth of the Tropical Rain Forest provides an ideal habitat for the **Blue-tailed,** or **Banded, Pitta** of Malaysia.

True orioles are found only in the Old World. Most species are medium-sized

**BARE-THROATED BELLBIRD — Brazil**

**BLUE-TAILED PITTA — Malaysia**

with black and yellow plumage ("oriole" stems from the Latin *aureolus*, meaning golden), although some are black and red. They are forest dwellers that feed on fruits, berries and insects. The **Black-naped Oriole** of Malaya and Indonesia is to be seen in the Tropical Rain Forest.

The nearly cosmopolitan crow family contains not only such sombre-plumaged species as the **Raven, Common Crow** and **Jackdaw,** but many richly-colored ones as well. Jays range all the way from the delicately-hued **European Jay** to the gaudy **Green Jay** and purplish **Talamanca Jay** of the American tropics. Among the pies are California's **Yellow-billed Magpie,** the **Formosan Blue Pie** and southeastern Asia's **Red-billed Pie.**

Superficially crow-like, the Australian piping crows, or bell magpies, are classified in a separate family. Within their ranges, both the **Black-backed** and **White-backed Piping Crows** are common birds.

Another strictly Australasian family is that of the mud-nest builders. The **Magpie-lark** is found from one coast of Australia to the other, while the **Apostlebird** is limited to the north and east.

Birds of paradise of New Guinea and Australia are remarkable not only for their colorful plumage but also for their unique courting displays. Species shown here have included **Meyer's Sickle-billed Bird of Paradise, Princess Stephanie's, White-flanked Six-plumed, Magnificent, Count Salvadori's, Lesser, Red** and **Prince Rudolph's Blue.**

Bower birds are known best for their peculiar courtship habits. The **Satin Bower Bird** of Australia constructs a bower of twigs that is used only for courting, not nesting. Others include the black and gold **Regent Bird** and the pink-crested **Spotted Bower Bird,** of Australia.

The diminutive titmice inhabit both hemispheres. The **Red-sided Titmouse** of Japan is popular as a cage bird.

Babblers are well represented throughout the warmer parts of the Eastern Hemisphere. They range from large showy species like the **Spectacled** and **White-crested Laughing Thrushes** to the small

**EUROPEAN JAY**

**WHITE-BACKED PIPING-CROW — Australia**

MAGPIE-LARK — Australia

and brightly-colored **Red-billed** and **Silver-eared Hill-tits,** all Asiatic.

Bulbuls, prized as songbirds, are common throughout the warmer parts of Africa, Asia and Indonesia. The **Yellow-vented Bulbul** is perhaps the most abundant bird in the Philippines; the **Red-vented** is common in India and Ceylon, and the **Golden-vented** inhabits Indonesia. The crested **Black Bulbul** is an Indian form.

Leafbirds comprise a small family of fruit-eating birds native of the forests of southeastern Asia and Indonesia. Most species are small with green or yellow predominating in the plumage, an example being the **Golden-fronted Leafbird** which ranges from India to Sumatra and Borneo. Sometimes included in this family is the **Fairy Bluebird,** the male of which is jet black with ruby red eyes and a cobalt mantle, with feathers which appear to be enameled.

The thrasher family of the New World is noted for its melodious mimics. Best known locally are the **Western Mockingbird** and the **California Thrasher.**

SPOTTED BOWER BIRD — Australia

WHITE-CRESTED LAUGHING THRUSH — Himalayas

**COLETO — Philippine Islands**

Thrushes occur throughout most of the world. The **Shama** and **Dyal-bird,** or "Magpie Robin," are noted songsters native to southeastern Asia; while the **Blackbird,** the **Fieldfare** and the **Redwing** inhabit Europe. Other thrushes include our native robins and bluebirds. Occasionally exhibited is the **Slate-colored Solitaire** of Mexico.

Waxwings are tan, crested little birds that feed on fruits and insects. The **Cedar Waxwing** is limited to the New World, but the larger **Bohemian Waxwing** occurs in Europe as well.

**ROTHSCHILD'S MYNAH — Bali**

Starlings and mynahs inhabit the Eastern Hemisphere. One group, known as glossy starlings, includes the **Glossy Starling,** the **Superb,** and the **Long-tailed Glossy,** all of Africa. Another group consists of the Asiatic mynahs, best known of which is the **Hill,** or **Talking Mynah,** a glossy black bird with yellow wattles and a remarkable ability to mimic. Other members of the family include the **Black-winged Starling** of Java, the **Gray-backed Starlet** of China, the Philippine **Coleto, Pagoda Mynah** of India and the rarely-seen **Rothschild's,** or **Bali White, Mynah.**

The Old World sunbirds invariably invite comparison with the American hummers since they are small, brilliantly-colored, and feed on nectar and insects. They range from Africa through southern Asia and Indonesia to Australia. The **Purple-rumped Sunbird** inhabits the India and Ceylon region.

White-eyes enjoy a similar distribution in the Old World. All are small, greenish birds, usually with a ring of white feathers around each eye. Typical is the dainty **Indian White-eye.**

The minute honey-creepers, or "sugar-birds," found in the American tropics, are brightly-colored and have long, slender bills. Best known is the **Blue,** or **Yellow-winged, Honey-creeper.**

Weaver birds are superficially similar to our sparrows and finches although not closely related. Weavers, which are seed eaters, are widely distributed in the warmer

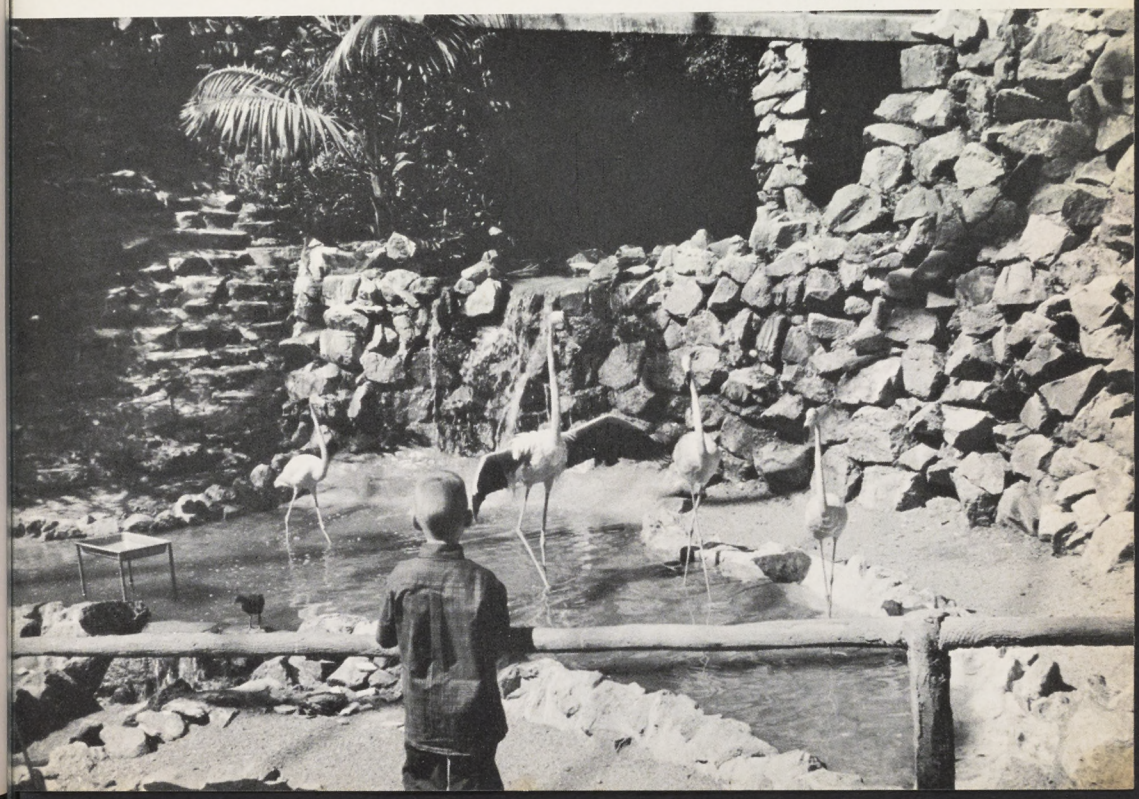
regions of the Old World. Most spectacular are the African whydahs, the males of which have long flowing tails during the breeding season: **Pin-tailed** and **Paradise Whydahs** are small birds, while **Jackson's Whydah** of Kenya is considerably larger. Of the typical African weavers, the **Orange Bishop-bird,** the **Red-billed Weaver** and the **Napoleon Weaver** usually are exhibited. Others shown may include the munias or mannikins of Asia and Australia, the waxbills of Africa, Asia and Australia, the African fire-finches and the parrot finches of the south Pacific. Three especially popular as cage birds are the **Java Sparrow, Gouldian Finch** of Australia and the African **Cordon Bleu.**

The New World oriole family contains many familiar birds: blackbirds, grackles and troupials. Most members have sharp pointed bills and their plumage usually is black, often with red, yellow or orange. The true troupials include the **Troupial,** or "**Bugle Bird,**" **Scott's Oriole,** the **Yellow-tailed Oriole,** the **Arizona Hooded Oriole** and **Bullock's Oriole. Brewer's Blackbird,** the **Dwarf Cowbird** and the **Red-winged Blackbird** also are members of the family.

Another New World family is that of the tanagers which are most abundantly represented in the tropics. Most species are brightly colored. Euphonias are small tanagers, one of the prettiest being the **Blue-hooded** of Mexico. The handsomest of the entire family may well be the **Superb Tanager** of Brazil. Others exhibited may include **Darwin's Tanager** of Peru, the **Blue-crowned Chlorophonia,** our own **Western Tanager,** the **Brazilian Scarlet** and the **Maroon,** native of northern South America.

The true finches and sparrows, like the weavers, are mainly seed-eaters. They have cone-shaped bills and range in size from the **Pyrrhuloxia** and the **Cardinal** down to the little siskins, goldfinches and buntings. Of those shown here, the following are especially noteworthy: the **Pope Cardinal, Brazilian Cardinal, American Goldfinch, Cuban Grassquit,** and **Desert Sparrow.** The **Gray Singing Finch** and the **Green Singing Finch** are from Africa. The **European Goldfinch** and the **Venezuelan Hooded Siskin,** which is bright orange with a black head, are easy to keep and always popular as cage birds.

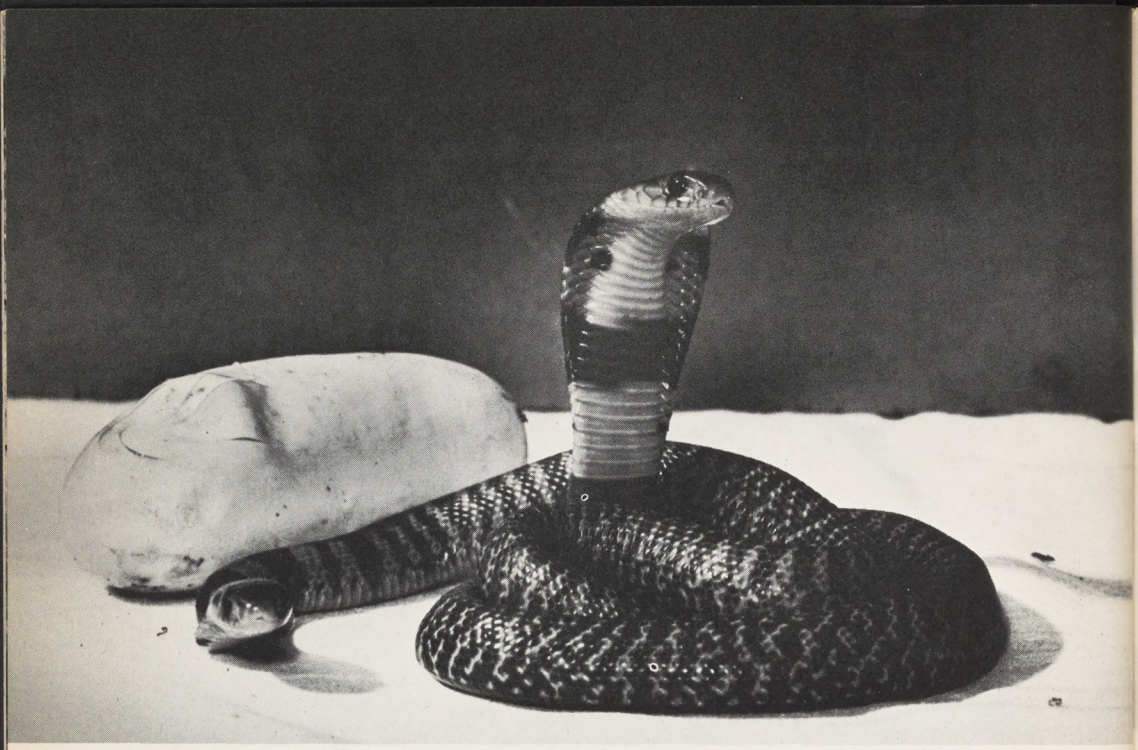
**SCRIPPS FLIGHT CAGE**



RAIN FOREST — Walk-thru Aviary

# REPTILES

GIANT TORTOISES



**INDIAN COBRA hatchlings**

The reptile mesa displays one of the finest and largest reptile collections in the world. A large, rectangular Reptile House exhibits most of the snakes. Fifty-five glass-fronted cages, facing on an outside arcade, contain approximately 130 specimens, representing 60 different kinds of snakes and lizards.

The interior of the reptile house provides a necessarily large amount of work space. There are areas for surplus specimens, quarantine room, laboratory and a large room where thousands of rats and mice are raised each year as food for the snakes. Corridors containing the snake cages are radiantly heated to a temperature of 80°F. throughout the year.

## **Snakes:** *Serpentes*

The majority of snakes on display are publicly fed dead rats and mice once each week on Wednesday mornings.

Approximately 3,000 different kinds of snakes are known to exist. Various kinds and degrees of specialization have been evolved by these animals. The many adaptations are reflected in the habits and structures of the snakes. The highest development in this group is achieved by the vipers and pit vipers of the Old and New Worlds. Undoubtedly the best known of the New World pit vipers are the rattlesnakes. These, together with the water moccasin, copperhead and coral snake, make up the four dangerously venomous snakes occurring in the United States.

Pit vipers are so-called because of the presence of a conspicuous depression or pit in the side of the face. Inside this pit, and dividing it into two chambers, is a delicate membrane richly supplied with

small nerves. The use of this pit was unknown for many years. Since all snakes lack external ears, hearing was speculated as the function of the pit. Eventually it was discovered that this organ was a temperature differential receptor and served its owner in the detection and location of warm-blooded prey, such as birds and mammals. Using this organ, a pit viper has an uncanny ability to locate, focus on, and strike a victim without even seeing it.

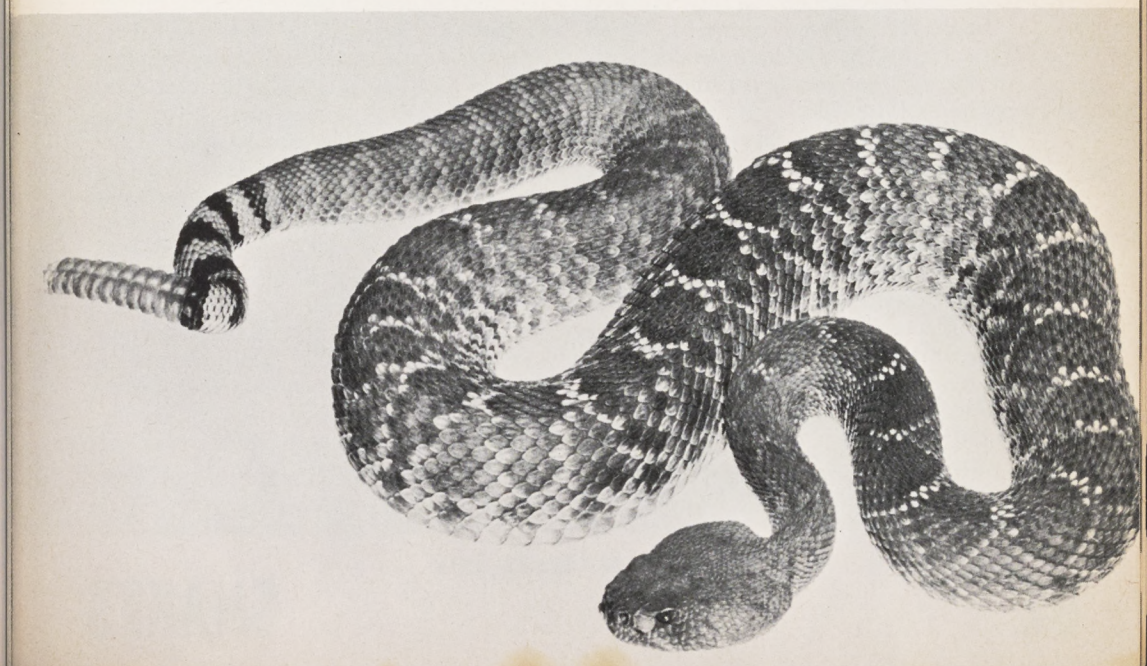
Rattlesnakes are found only in the Western Hemisphere and range from southern Canada southward into northern Argentina and Uruguay in South America. The 69 species and subspecies presently known occur from sea level to elevations as high as 14,500 feet. This latter record is for a Mexican rattler. In California, rattlers are known to range as high as 11,000 feet, and up to 10,000 feet in other western states. They also are found on several islands off the coasts of the Americas. Generally about a dozen or more of the different kinds of rattlers are on display at the reptile house. These range in size from the large **Western Diamond Rattler** and **Mexican West Coast Rattler** to some of the more diminutive forms, such as the **Mottled Rock Rattler, Ridge-nosed Rattler** and **Massasauga,** or **Pigmy Rattler.** The largest species of rattler is the **Eastern Diamond Rattler** which may reach a length of 8 feet.

Frequently one hears that the age of a rattler may be determined by the number of segments in its rattle string. This is not true, for the reason that each time the rattler sheds his skin he acquires a new segment for his rattle string. Shedding may occur from one to five times per year, depending on latitude, age, and rapidity of growth of the individual snake.

In contrast to the majority of harmless snakes, rattlesnakes are ovoviviparous and bear their young rather than lay eggs. The young are perfectly formed miniatures of the parent when born. Babies are provided with fangs and venom and are fully capable of securing their own food and caring for themselves. There is no parental care of the young.

While pit vipers are found from the eastern edge of Europe to southeastern Asia and in the Western Hemisphere, true vipers occur only in the Eastern Hemisphere: in Europe, Africa and eastward into the Malaysian region. Lacking only the facial pits, the true vipers are otherwise very similar to the pit vipers. Both types of snakes are distinguished by their long fangs which are mounted on a moveable jaw bone. This accommodates the great fang length by allowing this special-

**RED DIAMOND RATTLER — Southwestern United States**



**RHINOCEROS VIPER — Africa**

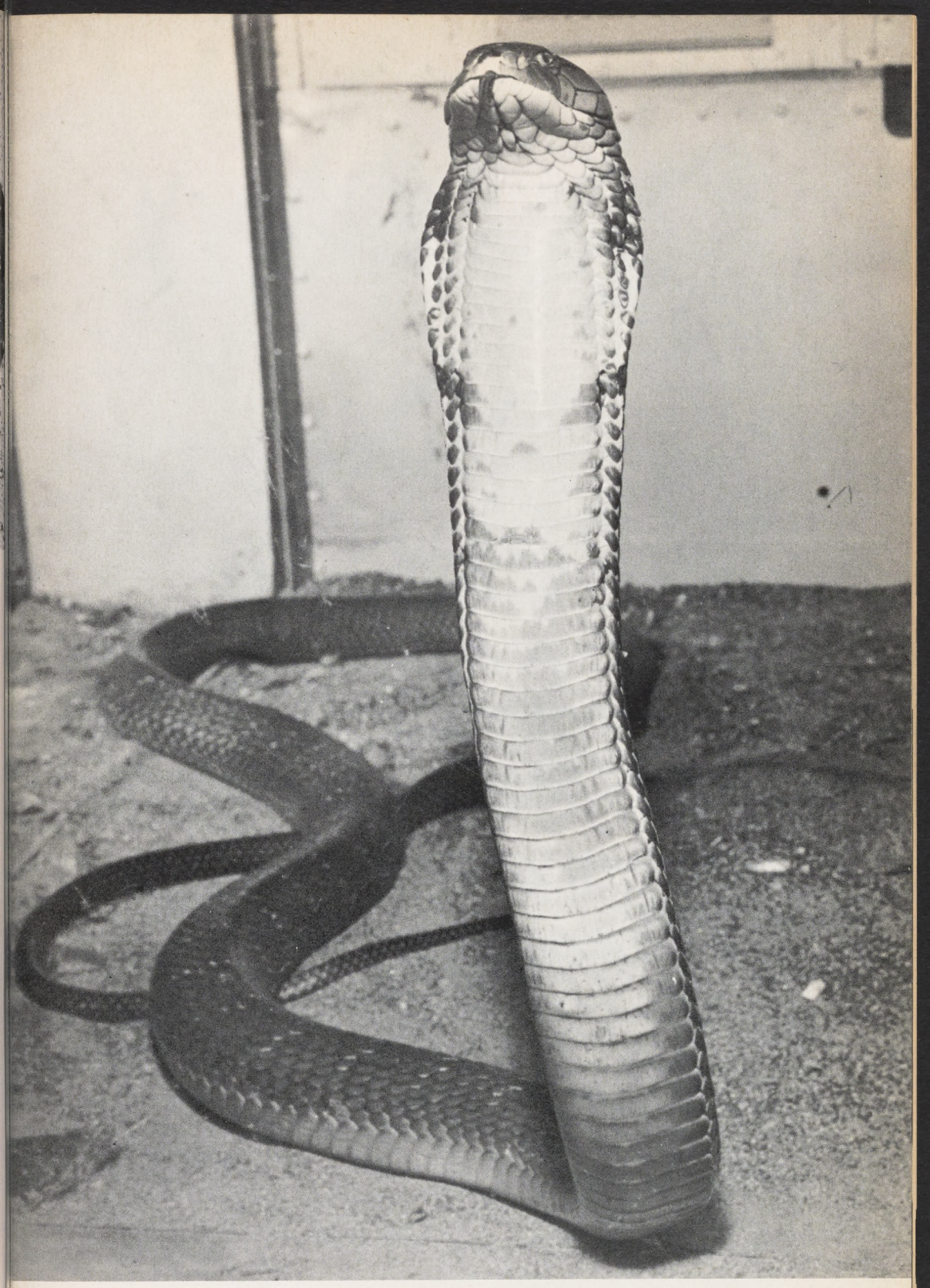
ized hollow tooth to be folded against the roof of the mouth when not in use.

Many of the true vipers are tremendously heavy-bodied, their girth being all out of proportion to their length. The **African Puff Adder** and the **Gaboon Viper** of Equatorial Africa, and the beautifully marked **Rhinoceros Viper,** also of Central Africa, are noteworthy for their disproportionate girth as well as their sluggish dispositions. Smaller and more delicate in appearance is the interesting little **Horned Viper** of the desert regions of North Africa and Arabia. The long slender horns over the eyes are purely ornamental and serve no useful purpose.

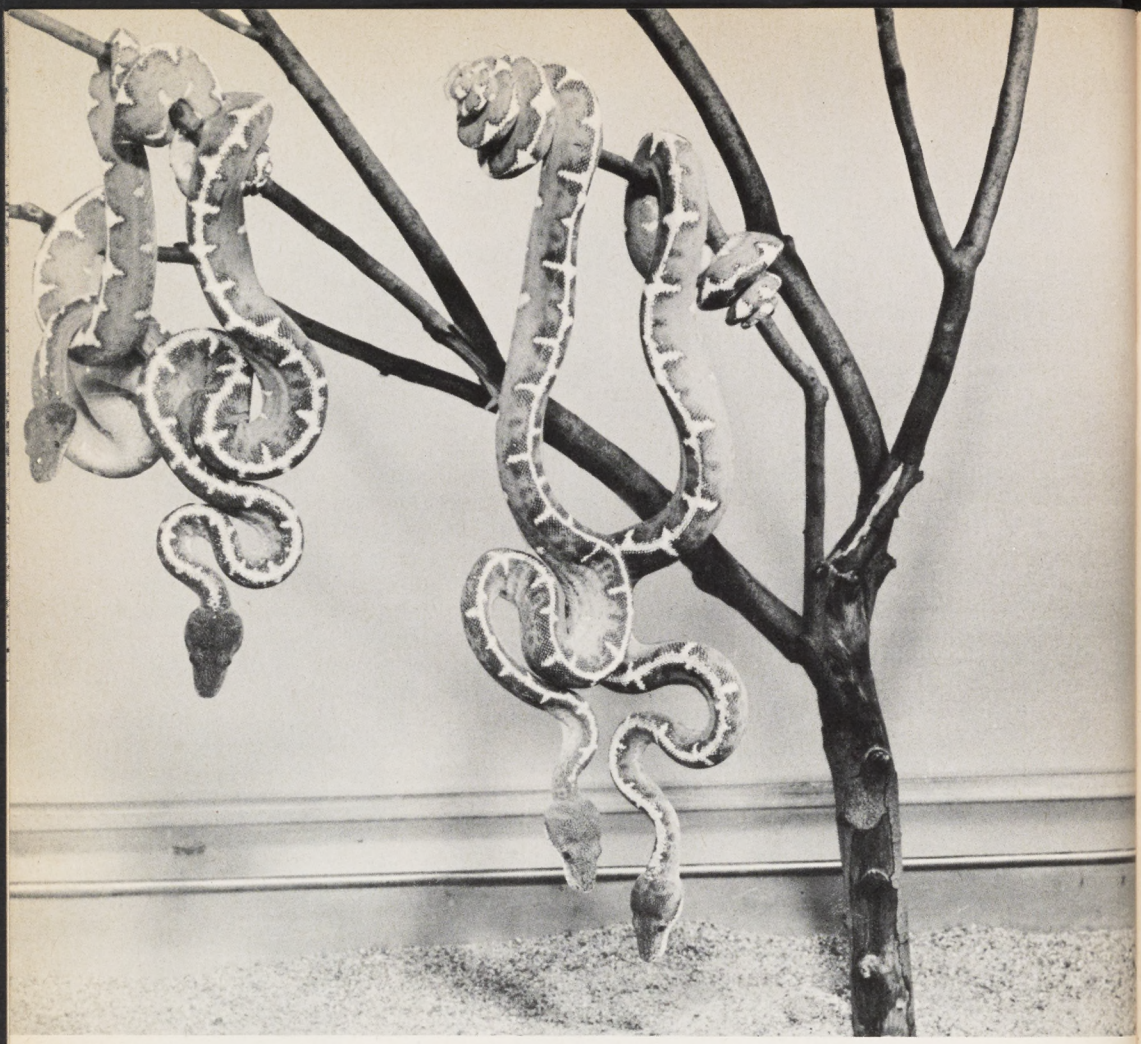
Like that of the pit vipers, the venom of the vipers is extremely dangerous and has its principle effect upon the blood of the victim, variously causing hemorrhage, clotting, breakdown of the walls of blood vessels and dissolution of blood cells.

The cobras and their allies comprise the family Elapidae. Markedly different fang mechanisms and venom action distinguish this group of snakes from the vipers and pit vipers. Elapid snakes have short, permanently erect fangs, and the venom acts principally upon the nervous system of the victim. Most of the cobras are quite nervous and easily upset, and generally do not take well to captivity. The most obvious indication of such uneasiness occasionally may be seen in captive specimens in the form of a "hood." This structure is erected only when the snake is angry or annoyed in some way. The hood is formed by the spreading of the snake's skin over the elevated ribs of the neck region. Some cobra species have interesting designs on the neck which show to best advantage only when the hood is spread. The **Common Indian Cobra** is represented in the reptile collection by captive-bred specimens hatched here in October of 1946. The most awe-inspiring of the cobra clan to be viewed here is the spectacular **King Cobra** of the Malaysian region. This is the largest species of the cobra group, the maximum recorded length being 18 feet 4 inches. Although most of our snakes are fed dead rats and mice, the King Cobra prefers snakes exclusively for its diet.

From Australia, where all the venomous snakes belong to the family Elapidae, comes the unspectacular but very deadly **Tiger Snake.** This species has the reputation of having the most potent venom of any poisonous snake in the world. Austra-



KING COBRA — Malaysia



**EMERALD TREE BOAS — South America**

lia further has the doubtful distinction of being the only continent where venomous snakes greatly predominate over the harmless species.

The majority of the world's harmless snakes belong to a very large family, the Colubridae. Typical representatives of this group are such familiar American snakes as racers, bull snakes, gopher snakes and king snakes. The majority of snakes in the family are oviparous; that is, they lay eggs. Of these egg-laying species, the greater part merely dig a hole, deposit the eggs, cover and abandon them to unassisted incubation by ground temperatures and moisture. A very few species habitually remain with the eggs during incubation.

Other common representatives of the large family of harmless snakes are the garter and water snakes. Just behind the Reptile House is a large moated enclosure or pit. This generally contains more than 100 specimens of garter and water snakes. These are fed small dead fish once a week. The garter and water snakes differ from many harmless species in that they are ovoviviparous and bring forth living young. More than 90 young may be born to a single female water snake.

A number of representatives of the large family Colubridae may be seen on display

in the Reptile House. Among these are the back-fanged snakes, such as the Malayan **Mangrove Snake** and the African **Boomslang,** as well as the harmless **Formosan** and **Indian Rat Snakes** and the more familiar American corn snakes, bull snakes and king snakes. This family includes many species that are economically beneficial to man, since they devour great numbers of rodent pests, including rats, mice and ground squirrels, which cause thousands of dollars worth of crop damage each year.

The giant snakes of the world belong to the family Boidae, which includes both the boas and the pythons. Boas have their principal headquarters in the New World with a few representatives in the Eastern Hemisphere. Pythons, on the other hand, are wholly confined to the Old World.

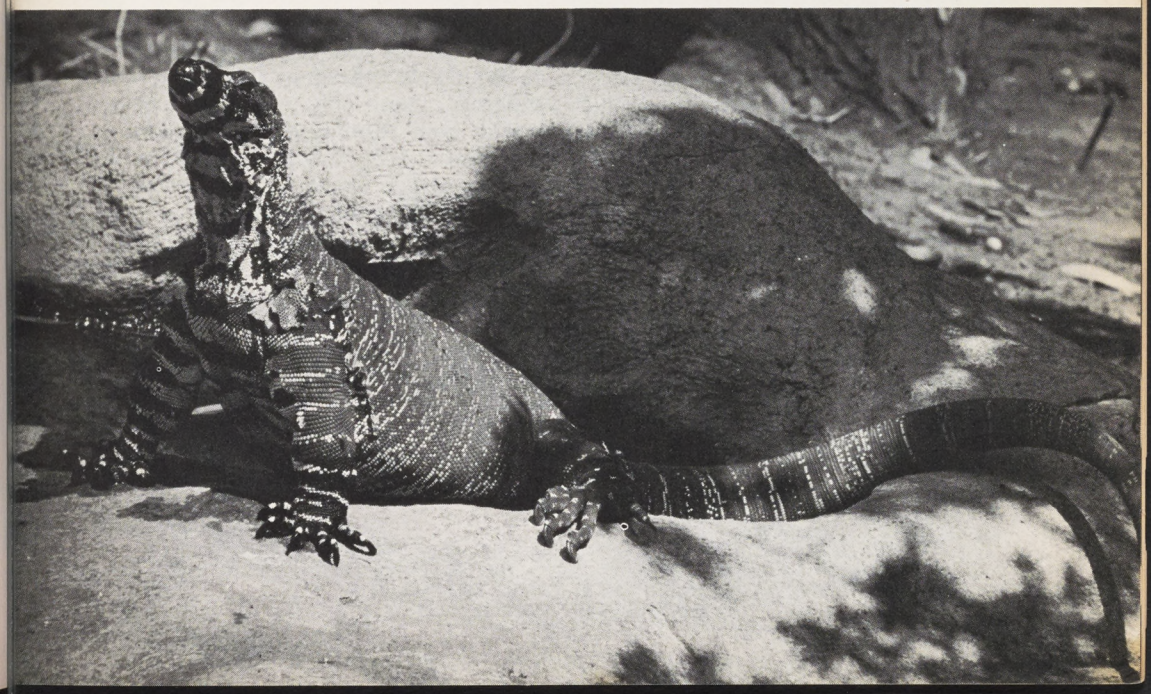
The reptile collection generally contains more than a dozen kinds of boas and pythons. These range in size from the smaller, but spectacularly beautiful species, such as the **Emerald Tree Boa** of Northern South America, **Green Tree Python** of New Guinea and Queensland, and **Blood Python** of Malaya and Indonesia, to such giants as the **African Python,** the **Anaconda,** or **Water Boa,** of South America, and the **Reticulated Python** of Asia. The Reticulated Python, with a known length of 33 feet, could formerly lay claim to the world's record as the longest snake. It is possible, however, that the Anaconda may be the world's champion. A recently recorded length of 37.5 feet for this snake is accepted by some herpetologists. Like most nocturnal snakes, boas and pythons have cat-like eye pupils. They are, of course, non-venomous. There is no truth to the tale that snakes with elliptical pupils are always dangerously venomous. Neither are all snakes with round pupils entirely harmless.

The boa constrictors of Central and South America are noted for their habit of constricting or wrapping around their prey and squeezing it to death. This means of securing food is common to all boas and pythons as well as to a great many smaller harmless snakes, such as king snakes and gopher snakes.

## **Lizards:** *Sauria*

The reptile collection generally contains from 30 to 40 different kinds of lizards. Most of these are displayed in two large outdoor pits west of the Reptile House and between the enclosures containing the tortoises and turtles. A few lizards also are to be seen on display in the cages of the Reptile House. These include several species of desert lizards such as the **Desert**

**LACE MONITOR—Australia**



**Iguana, Whiptail Lizard, Spiny Lizard, Fringe-toed Sand Lizard** and **Horned Toads.** Also to be seen in the Reptile House are the **Gila Monster** and the **Mexican Beaded Lizard,** the only poisonous lizards in the world. The Gila Monster is found in southwestern Utah, southern Nevada, Arizona, southwestern New Mexico and into Sonora, Mexico. Although it is venomous, it does not have the highly specialized venom injecting mechanism of the dangerously poisonous snakes. There are very few authenticated cases of death from the bite of a Gila Monster.

The uppermost of the large outdoor pits west of the Reptile House displays various species of monitor lizards, including **Asiatic Monitors,** or **Kabaragoya, Lace Monitors** from Australia, and **South African Rock Monitors.** Various other species of monitors and iguanas also may be seen here from time to time, for the collection is never static. The monitor group is composed of some 30 species ranging from Africa eastward through India to the Philippines and south to Australia. These include the largest of the living lizards, the **Komodo Dragon** of certain Indonesian islands. The Komodo Dragon may reach a length of about 10 feet. Monitor lizards are strictly carnivorous in their diet and eat a variety of animal food such as birds, small mammals, turtle and crocodile eggs. Our specimens are fed a weekly ration of chunks of horse meat and also are occasionally treated to dead mice and rats.

The most westerly of the outdoor enclosures or pits displays a variety of iguanid lizards. Here may be seen **Spiny-tailed Iguanas** from Tropical Mexico as well as desert islands in the Gulf of California; three species of Chuckwalla from the southwestern deserts of the United States and islands in the Gulf of California; **South American Green Iguanas** (or **Chinese Dragons,** as they are known in the circus and sideshow trades); **Cuban Iguanas; Basilisks** from Mexico and Central America and **Collared Lizards** and **Desert Iguanas** from the southwestern United States. Nearly all of these lizards are principally vegetarian in their food preferences. They are fed lettuce daily and in addition are afforded the opportunity to forage for food of their own choice in the pit. This is furnished in the form of the leaves and blossoms of the Palo Verde trees growing in the pit, as well as the grasses which grow there. During the warm summer months a careful scrutiny of the trees often will reveal several lizards high up in them browsing among the leaves and blossoms.

Of course none of the lizards in these outdoor pits are poisonous. However, all have strong jaws and sharp teeth and are very capable of inflicting a painful bite if they are molested.

## Turtles: *Chelonia*

In addition to what is probably the world's largest collection of giant tortoises, about 40 different species of aquatic and land turtles, or tortoises, are displayed on the reptile mesa. **Australian Snake-necked Turtles, Alligator Snappers, Box Turtles, Madagascan Radiated Tortoises** and **Star Tortoises** from India and Ceylon are among the many different kinds shown. Most of the land turtles, or tortoises, are vegetarians. A few, such as the **Box Turtles,** eat both meat and vegetation. The aquatic turtles are fed only ground horsemeat, and this once per week.

The giant land tortoises, because of their outstanding size, probably arouse more visitor interest than any other specimens in the reptile collection. The **Giant Tortoises** are found only in two areas of the world, both island groups. One area of occurrence is the Aldabra group in the Indian Ocean from which comes the so-called **Elephant Tortoise.** The other type of giant tortoise comes from the Galapagos Islands which lie about 600 miles off the coast of Ecuador in South America. Formerly extremely abundant due to the absence of enemies in their island retreats, the giant tortoises were soon reduced in numbers by man after their edible qualities had been discovered. The first serious inroads upon the tortoise population of the islands were made by the 18th and 19th

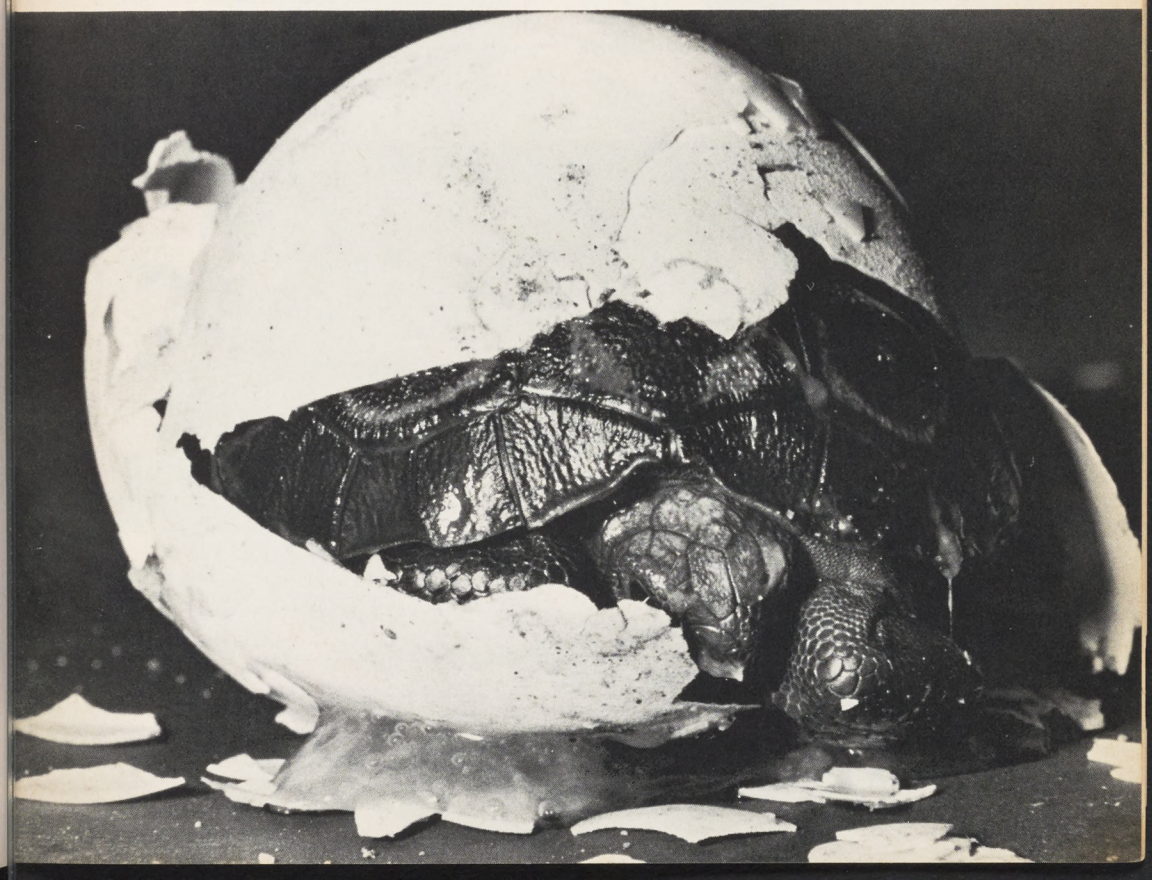
century whalers, buccaneers and men-o'-war. The sailing ship mariners of those early days were not long in discovering in the tortoises a valuable source of fresh meat. Literally tens of thousands of these helpless and harmless animals were removed from their island homes and taken to sea stored in the holds of sailing ships. The giant tortoises were known to be capable of subsisting for as long as 14 months in the hold of a ship without either food or water. Their tenacity of life as well as their succulence rendered them of great value to seafarers in the days long preceding the development of refrigeration.

The giant tortoises are strictly vegetarian. Here at the Zoo they daily are offered several crates of lettuce as well as a crate of carrots. Once a week they receive several crates of spineless cactus, a delicacy much to their liking.

The largest of our giant tortoises is a specimen from the Galapagos Islands. It is about four feet in length and, at the last weighing, tipped the scales at a dainty 526 pounds. Because of his great size, and also because of his very worn and pitted shell, we estimate his age to be at least one hundred years. But there is no way to accurately determine the age of any of these tortoises. They are probably the longest lived animals in the world. A specimen of the **Elephant Tortoise** is known to have lived in captivity for 152 years before it was accidentally killed.

Each evening during the cooler months of the year and when inclement weather is likely, the giant tortoises are put "to bed" in their electrically-heated barn. Because they come from a warm, equatorial climate they must be protected from the rain and cold of our area. The tortoises are all well accustomed to going to bed at night, having done so for a great many years. It is no problem to get them into the barn under their own power. In spite of their slow, plodding gait, the "tortoise drive" usually takes only about 15 minutes.

**GIANT TORTOISE hatchling**



## **Crocodilians:** *Crocodilia*

The enclosures containing large specimens of these lizard-like reptiles are located at the extreme west end of the reptile mesa. Each enclosure has a large tank of water and plenty of room for the animals to lie in the sun on the grassy bank. Basking on the bank is done during the warmer part of the day when air temperatures are high; when air temperatures are too low for the creatures' liking, they retire to the pool.

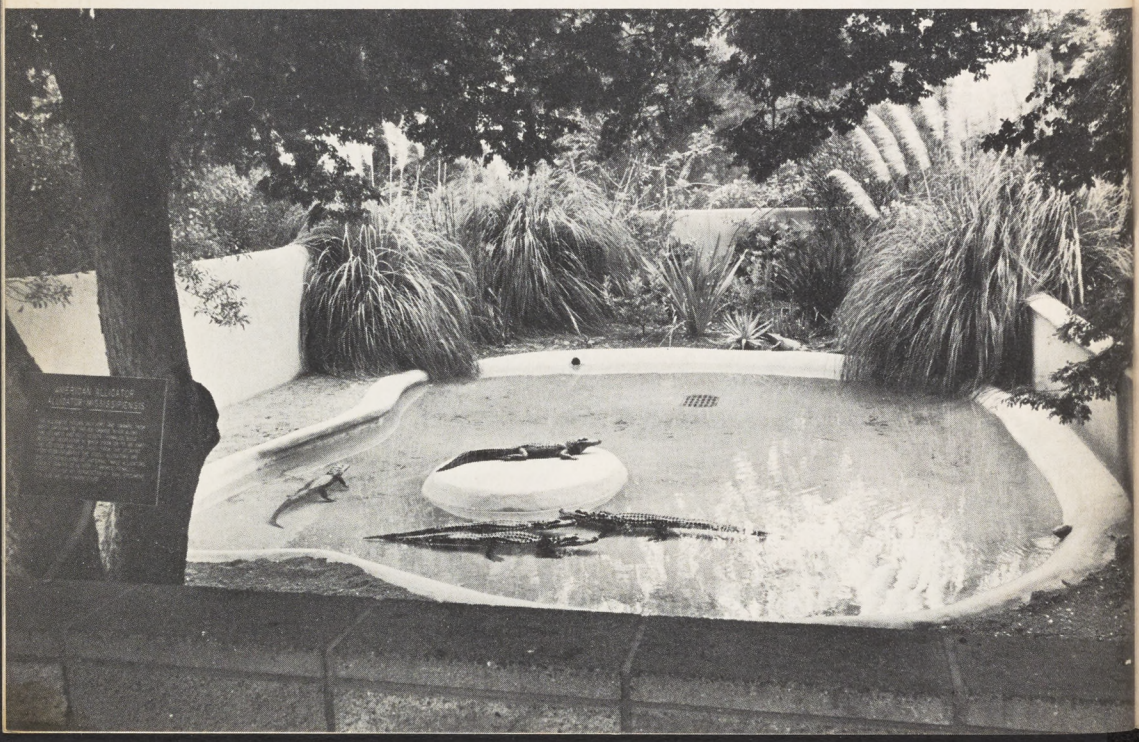
We seldom display any crocodilians, except the **American Alligator.** The reason for this is that our Southern California climate is not well suited to the keeping of crocodiles outside during the winter months. Alligators are more tolerant of our winter-time temperatures and do quite well outside.

In a pit just behind the Reptile House are displayed small alligators. These generally range in size from youngsters a foot or so in length to older individuals three or four feet long. When these young alligators become too large for this pool, they are moved to the larger ponds at the west end of the reptile mesa. Most of the specimens to be seen in the large alligator enclosures have been raised from babies right here at the Zoo.

Depending on their size, our alligators are fed ground horse meat, lungs or chunks of horse meat. The youngest specimens get the ground meat and the largest the lungs. They are fed once per week, except during the period from about the end of October to the end of April. During this period the outside temperatures are not high enough to give the alligators an appetite and they fast all winter long.

People often ask what is the difference between an alligator and a crocodile and usually add, "Which one is it whose upper jaw opens instead of the lower one?" The answer is somewhat involved. Scientifically there are but two alligators; that is, two crocodilians belonging to the genus **Alligator.** One is the alligator of the southern United States and the other is found in China. All other similar animals also are crocodilians but do not belong to the genus **Alligator.** All crocodilians are similar in structure and all open their jaws in the same way. Just as in human beings it is the lower, not the upper, jaw that opens. In the United States the alligator is found throughout the Southeastern States and has a short, blunt nose. The **American Crocodile** is found only on the tip of Florida and has a longer pointed nose.

**AMERICAN ALLIGATOR**



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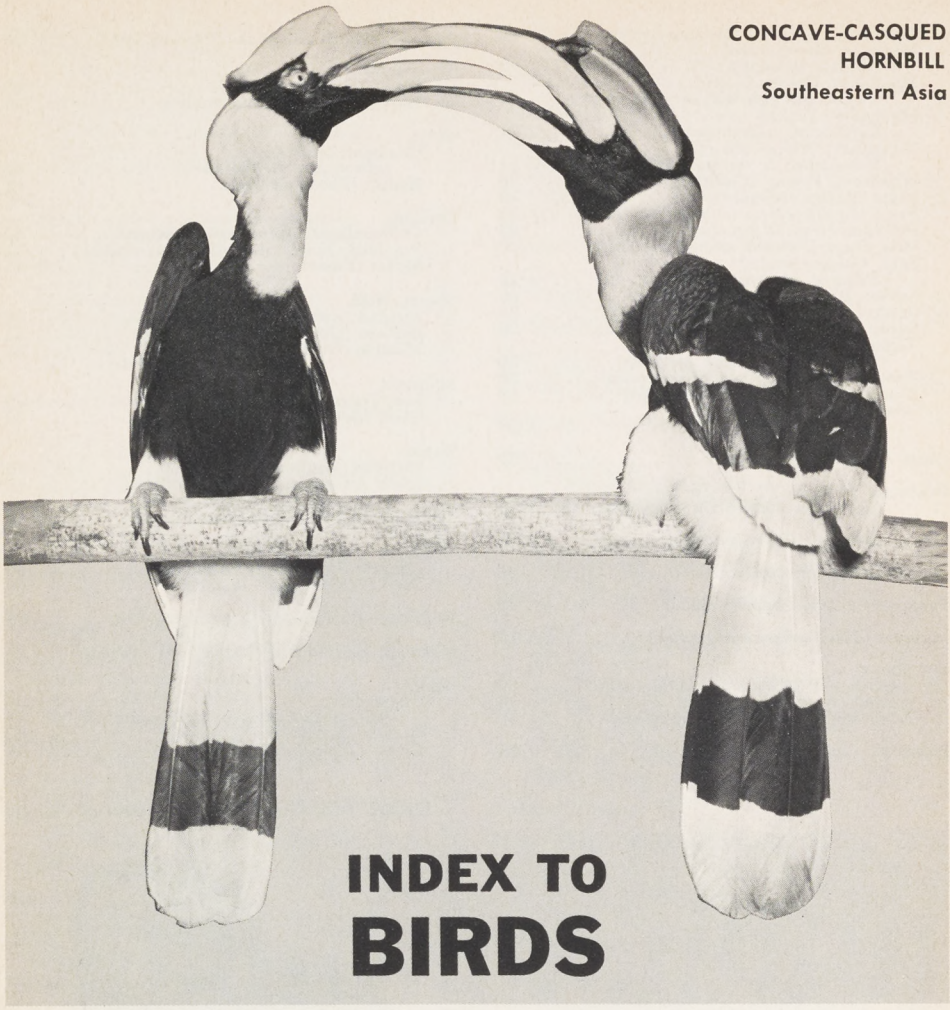
**HAMLYN'S GUENON — Equatorial Africa**



CONCAVE-CASQUED HORNBILL
Southeastern Asia

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**HAWAIIAN GALLINULE**

CUBAN IGUANA

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- Bull Snake *(Pituophis catenifer sayi)* . . . . . 95
- Common Indian Cobra *(Naja naja)* . . . . . 92
- Eastern Diamond Rattlesnake *(Crotalus adamanteus)* . . . . . 91
- Emerald Tree Boa *(Corallus caninus)* . . . . . 95
- Gaboon Viper *(Bitis gabonica)* . . . . . 92
- Gopher Snake *(Pituophis catenifer)* . . . . . 95
- Green Tree Python *(Chondropython viridis)* . . . . . 95
- Horned Viper *(Aspis cerastes)* . . . . . 92
- Indian Rat Snake *(Pytas mucosus)* . . . . . 95
- King Cobra *(Ophiophagus hannah)* . . . . . 92
- King Snake *(Lampropeltis)* . . . . . 95
- Mangrove Snake *(Bioga dendrophila)* . . . . . 95
- Massasauga or Pigmy Rattlesnake *(Sistrurus)* . . . . . 91
- Mexican West Coast Rattler *(Crotalus b. basiliscus)* . . . . . 91
- Mottled Rock Rattlesnake *(Crotalus l. lepidus)* . . . . . 91
- Rat Snake *(Elaphe)* . . . . . 95
- Reticulated Python *(Python reticulatus)* . . . . 95
- Rhinoceros Viper *(Bitis nasicornis)* . . . . . 92
- Ridge-nosed Rattler *(Crotalus willardi)* . . . . . 91
- Tiger Snake *(Notechis scutatus)* . . . . . 92
- Western Diamond Rattlesnake *(Crotalus atrox)* . . . . . 91

Turtles-Tortoises
- Alligator Snapping Turtle *(Macrochelys temmincki)* . . . . . 96
- Box Turtle *(Terrapene)* . . . . . 96
- Desert Tortoise *(Gopherus agassizi)* . . . . . 96
- Elephant Tortoise *(Testudo gigantea)* . . . . . 96
- Galapagos Tortoise *(Testudo elephantopus)* . . . . . 96
- Radiated Tortoise *(Testudo radiata)* . . . . . 96
- Snake-necked Turtle *(Chelodina longicollis)* . . . . . 96
- Star Tortoise *(Testudo elegans)* . . . . . 96

## SERVICES AND MEMBERSHIP

The Zoo is managed by the Zoological Society of San Diego, a California nonprofit corporation, incorporated December 11, 1916. The Corporation was formed for scientific research and benevolent purposes. Ordinance #1845 new series grants the Zoological Society of San Diego "the right to occupy, maintain and operate zoological gardens in Balboa Park, committing in said Society custody and maintenance of Zoological exhibits therein." The most recent new series ordinance #6605 was adopted by the Council of the City of San Diego on August 2, 1955, enabled by Section 77a of the Charter of the City of San Diego as amended.

The governing body of the Society is a Board of twelve trustees, with President, First and Second Vice-Presidents, Secretary and Treasurer. They appoint a Director who employs the operating staff. The Society operates on a fiscal year, July 1st to June 30th, and its annual meeting is held on the first Wednesday following Labor Day. The Board meets monthly throughout the year, and makes policy decisions.

## Dedicated to Children

Founders of the San Diego Zoo were: Harry M. Wegeforth, M.D.; Paul Wegeforth, M.D.; Fred Baker, M.D.; J. C. Thompson, U.S.N., M.C.; and Frank Stevens. Harry M. Wegeforth was elected President in 1916 and held this office until his death, June 25th, 1941.

Under Dr. Wegeforth's guiding hand, with personal funds and contributions from his friends, a very small Zoo grew into a world famous institution. "Dr. Harry" was inspired by his love of animals and children, and through the years the Zoo has been dedicated to the children of San Diego. Admission to the Zoo is available without charge to all children below the age of sixteen and to all high school students regardless of age in the City and County of San Diego.

The Zoo is known, in particular, for its rich collection of psittacine birds, the large primate colony (exceeding 60 species), one of the world's finest and largest reptile collections, and the exhibition of many particularly rare species.

## The Biological Research Institute and Zoological Hospital

The unique two-floor hospital and laboratory has four major activities; the Quarantine and Hospital Section, a Nursery for the care of young animals, a Laboratory Section, where causes of illness and death are determined, and Research Laboratories. Research rooms and physical facilities are offered workers in biological sciences.

Veterinarians, physicians and research workers in biological sciences are encouraged to consult with the staff and use the facilities of the hospital and laboratory.

## Unique Setting

The area now occupied by the Zoological Garden was taken over by the Society in 1922, with the sanction of the City Parks and Recreation Department. Dr. Wegeforth's plan utilized the unusual contours of mesas and canyons, and included the use of many exotic plants, as well as unusual and unique bar-less animal enclosures. The roads were built to accommodate sight-seeing buses, which has led to the now world renowned "Guided Bus Tours."

Belle J. Benchley, Director Emeritus, became associated with the Zoo in 1927. She published "My Life In a Man Made Jungle," "My Friends, The Apes," "My Animal Babies," and "Shirley Visits The Zoo," Little, Brown & Co., which give many intimate Zoo facts.

## Zoo School

A guided lecture service, provided by the Zoo to second grade students in City and County public, parochial and private schools, supplements their studies of animals of the world. The service includes transportation to and from the Zoo in the Zoo's own buses. Various courses in zoology are given young students, including handicapped children, during the summer season; and official zoo lecturers are available to the upper elementary classes during the regular school year. This program is conducted with the advice of the Education Committee, composed of professional school administrators and teachers, and is carried on by trained teachers on the Zoo staff.

## Publications

Publications of the Zoo are both popular and scientific. ZOONOOZ, a popular 16-page monthly publication, is available at $2.00 annually, $5.00 for three years, or 20c per issue. The scientific bulletins of the Society are priced on the basis of printing and distribution costs. Twenty-seven bulletins have been issued. The Society recently has sponsored the publication of "Rattlesnakes: Their Life Histories, Habits, and Influence on Mankind," a classic treatment by the world's authority,

L. M. Klauber, LL. D., University of California Press, in two volumes (1530 pages). Many scientific papers originate in the Biological Research Institute and are published in appropriate scientific journals.

## Membership

Membership in the Zoological Society of San Diego is available to those interested in the purposes of the Society. Annual Membership is $7.50 and includes a subscription to the monthly publication, "ZOONOOZ," admits the member to the Zoo without charge at any time, and in addition gives him five passes for guests. It also permits the member to participate in the affairs of the Society at the Annual Meetings. Other classes of membership are: Annual Sustaining, $25.00; Life, $500.00; Patron, $1,000.00; and benefactor, $10,000.00.

## Bequests

Members and friends of the Zoological Society of San Diego often have expressed a desire to give financial aid to the Zoo to assist in its growth and development. A bequest is a good means of giving this support. Following are suggested legal forms that may be considered:

GENERAL:

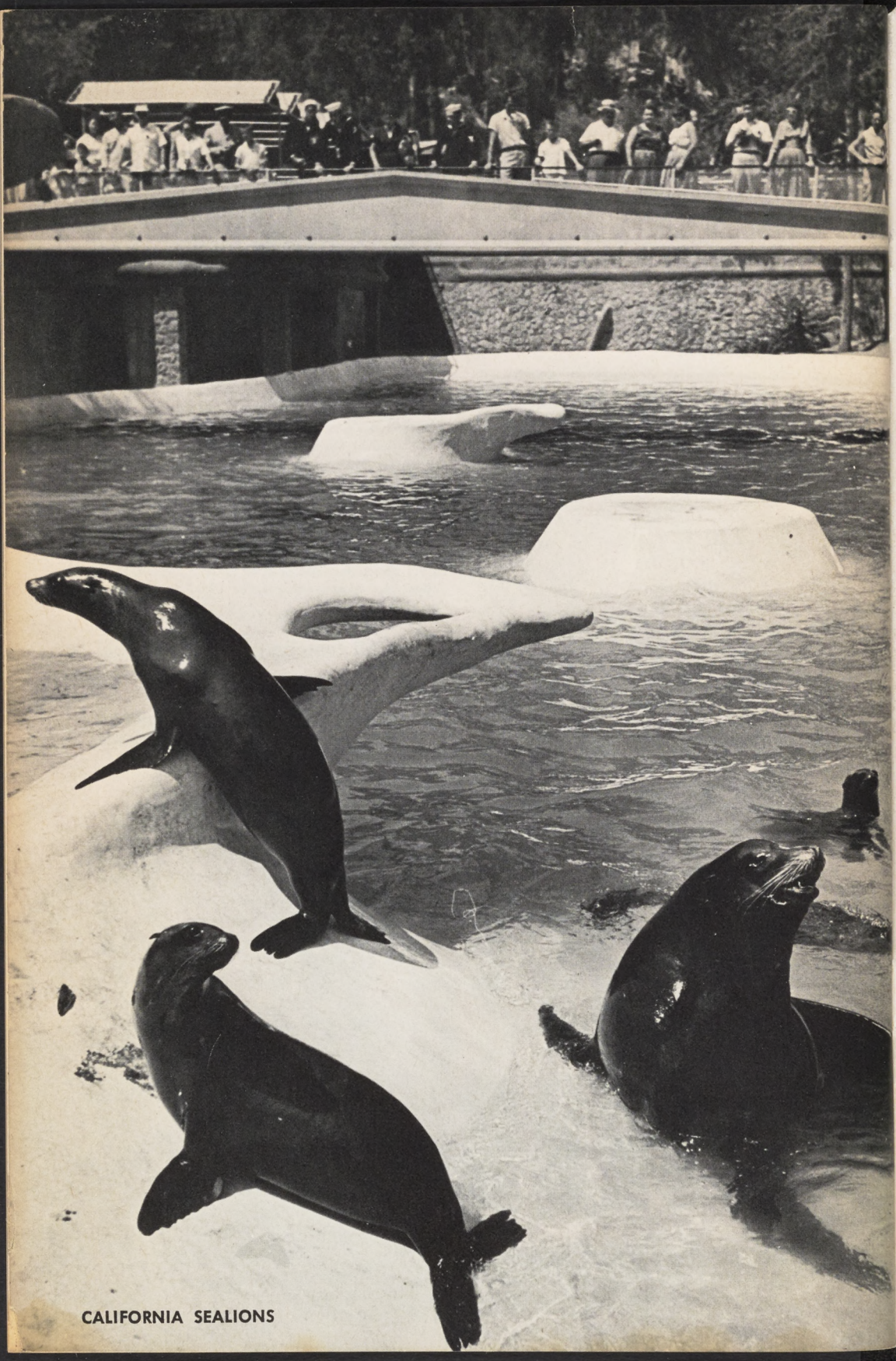
I do hereby give and bequeath to the Zoological Society of San Diego, a California non-profit corporation, the sum of $_____ dollars to be used at the discretion of the Society.

SPECIAL:

I do hereby give and bequeath to the Zoological Society of San Diego, a California non-profit corporation, the sum of $_____ dollars, and I direct that said sum be used for *(here should follow the special purpose for which money is to be used).*

NOTE: All contributions are deductible.

**The Zoological Hospital and Biological Institute.**



CALIFORNIA SEALIONS

## SAN DIEGO ZOO

**The Zoo is divided by a series of canyons into four mesas, extending from a main mesa which parallels Zoo Drive. Starting at the south end, the four mesas are lettered A, B, C and D. The canyons are lettered E, F and G, from the south.**

## MESAS

**A–MESA:** At the front of this mesa is the Reptile House, with the area to the west given over to open lizard pits, turtle and tortoise pens, and alligator and crocodile pools. Wegeforth Bowl also is located here and features seal shows daily. Entrance to the Children's Zoo is south of the Bowl.

**B–MESA:** Primates, including small monkeys, are shown here. Apes and baboons are housed on the north half of this mesa. Hundreds of miscellaneous birds also are exhibited here. The world's largest walk-through flying cages can be entered from this mesa. The south cage exhibits shore and marsh birds, while the cage on the north is a simulated rain forest.

**C–MESA:** Elephants and rhinoceroses are featured here, also some particularly rare species of smaller animals, including Okapi from the Congo.

**D–MESA:** In addition to a new, moated exhibit for giraffes, this mesa features hoofed animals: sheep, goats, antelope, deer, bison, moose and elk.

## CANYONS

**E–CANYON:** This is a wild bird sanctuary as well as exhibit area for ducks, geese, swans, ostriches and other birds on permanent display. Hippopotamuses also are exhibited in the pools here. Cheetah can be seen in their new "run" opposite the pools.

**F–CANYON:** The lower end of this canyon features storks and cranes, while farther up are grottoes for bears, lions and tigers, divided by a series of pools for sea mammals.

**G–CANYON:** Leopards, pumas, black panthers and jaguars are shown, also small cats, foxes, swine and canines.

## LEGEND

1, 2, 3, 4, 5, 6—RESTROOMS
7, 8, 9, 10, 11—PICNIC AREAS
12—INFORMATION
13—RESTAURANT
14—SOUVENIRS
15—FILMS
16—GUIDED BUS TOUR
17, 18, 19, 20, 21, 22—CANTEENS
23—WEGEFORTH BOWL FREE ANIMAL ACTS
24—ZOO ANIMAL HOSPITAL
25—MIGRATORY BIRDS
26—RAIN FOREST
27—FERN CANYON TELEPHONES